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Hitachi Compute Blade 500 Series
System Overview Guide

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Hitachi Data Systems

MK-91CB500001-12

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Preface

This document describes how to use the Compute Blade 500 series.

This preface includes the following information:

Notice: The use of Compute Blade 500 series and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

- ☐ Intended Audience
- ☐ Product Version
- ☐ Release Notes
- ☐ Document Organization
- ☐ Referenced Documents
- ☐ Document conventions
- ☐ Convention for storage capacity values
- ☐ Getting help
- ☐ Comments

Intended Audience

This document is intended for the personnel who are involved in planning, managing, and performing the tasks to prepare your site for Compute Blade installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.
- The reader is familiar with the location where the Compute Blade will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

Product Version

This document revision applies to CB 520X B2.

Release Notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Document Organization

The table below provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1, System Overview	Describes the parts of the server chassis, and various modules.
Chapter 2, Specification	Describes the specifications of the system interface.
Appendix A, Service Life Limited Parts	Describes service life limited parts.
Appendix B, Expiration of RoHS exemption	Describes expiration of RoHS exemption.

Referenced Documents

- Hitachi Compute Blade 500 Series Management Module Setup Guide, MK-91CB500014
- Hitachi Compute Blade 500 Series Site Planning Guide, EBS-DOC-023

- Hitachi Compute Blade 500 Series System Service Manual, FE-91CB500004

Document conventions

The term "Compute Blade" refers to all the models of the Compute Blade, unless otherwise noted.

This document uses the following typographic conventions:

Convention	Description
Regular text bold	In text: keyboard key, parameter name, property name, hardware labels, hardware button, hardware switch. In a procedure: user interface item
Italic	Variable, emphasis, reference to document title, called-out term
`screen/code`	Command name and option, drive name, file name, folder name, directory name, code, file content, system and application output, user input
< > (angled brackets)	Variable (used when italic is not enough to identify variable).
[ ] (square bracket)	Optional values
{ } braces	Required or expected value
| vertical bar	Choice between two or more options or arguments

This document uses the following icons to draw attention to information:

Icon	Meaning	Description
WARNING	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
CAUTION	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
NOTICE	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
Note	Note	This indicates notes not directly related to injury or severe damage to equipment.
Tip	Tip	This indicates advice on how to make the best use of the equipment.

Convention for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Getting help

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Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title and number including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems Corporation.

Thank you!

1

System Overview

This chapter describes the parts of the server chassis, and various modules.

- ☐ Server Chassis (enclosure)
- ☐ Server Blade
- ☐ HDD slot, order of installation, and indicator
- ☐ Management Module
- ☐ Switch Module
- ☐ Power Supply Module
- ☐ Fan Module
- ☐ User Maintenance

Server Chassis (enclosure)

This section describes server chassis.

Overview

The 6U server chassis can contain up to eight server blades and four switch modules. Compared with a 1U server chassis with an external rack mount network switch and FC switch, the 6U server chassis consumes less space, requires fewer cables and weighs less. The connection between each module is through the internal backplane in the server chassis. Thus a complicated cable connection is unnecessary. When you need to add a server blade to a chassis, you can add the server blade just by inserting it in a spare slot. The system is designed to consolidate existing rack-mount server systems, for server consolidation and for operation in a data center. Switch modules can be selected according to your needs. Management modules, switch modules, power supply modules and fan modules can each be provided in a redundant configuration such that the system can continue to operate even if one of the modules fails. Power supplies required for server blades are installed in a server chassis. Thus stable electric power can be supplied in a very small space. The external interface is shared between server blades using a switching function to conserve space. The server chassis for CB 500 offers the following key features:

- Up to 8 multi-core 2-socket processor half-wide blades
- Up to 4 multi-core 4-socket processor full-wide blades
- Up to 4 high-throughput flexible IO switch modules
- High density laminated substrate backplane for future IO interfaces
- 80 PLUS Platinum power supply and Power Capping with Energy reduction technologies
- High levels of reliability/availability/maintainability (RAS) including multiple redundant configurations and customer serviceability

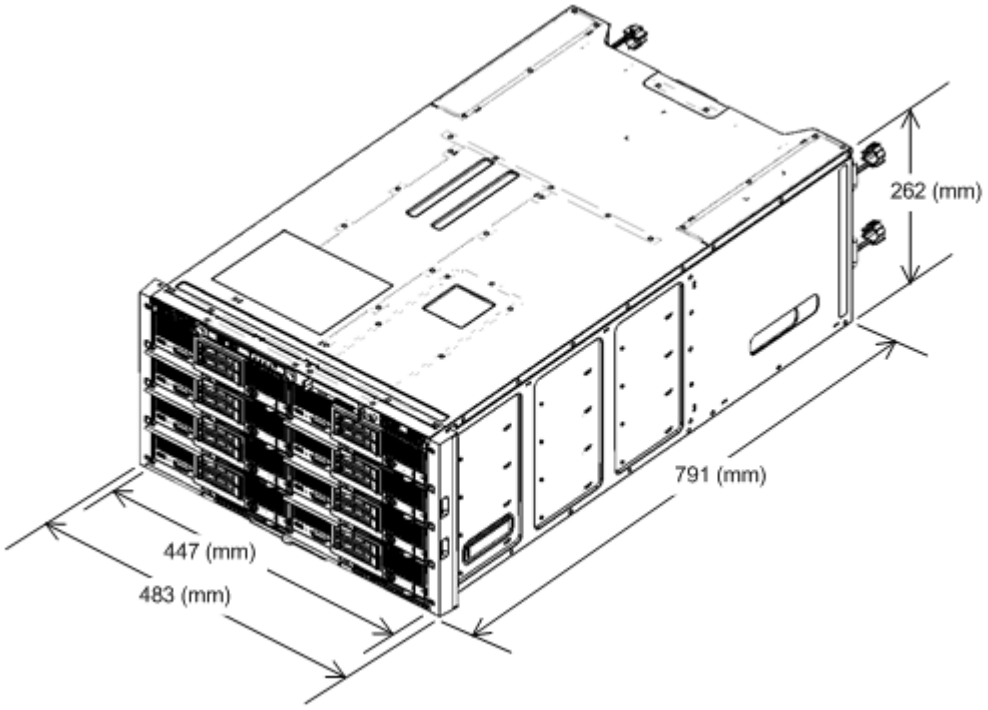

Figure 1-1 Server chassis

Server Chassis Specifications

This subsection provides specifications for server chassis.

Table 1-1 Server Chassis Specifications

Items		Specifications
Form factor	Type	19 inch Rack Mount (EIA)
	Height	6U (EIA)
Number of slot	Server blade	8
	Switch module	4
	Management module	2 (Redundant)
	Power supply module	4 (Redundant)
	Fan module	6 (Redundant)
Chassis size	Height	262 mm (Excluding protrusions)
	Width	447 mm (Excluding protrusions)
	Depth	791 mm (Excluding protrusions)
Front panel		1
Mass		Maximum: 130 kg (with all modules installed; including rack rails)

Items		Specifications
Temperature		5 to 40°C [Non-operating: -10 to 43°C][1]
Humidity		20 to 80 % [Non-operating: 10 to 90 %]
Vibration		2.45 m/s^2 max. [Non-operating: 9.80 m/s^2 max.]
Cooling	Method	Air-cooling by fan. Air intake: front side. Air exhaust: rear side.
	Flow	14.4 m3 / min

Notes:

1. 5 to 30°C [Non-operating: -10 to 43°C] for CB 520H B2 with CPU E5-2637v2 installed. 5 to 35°C [Non-operating: -10 to 43°C] for CB 520H B3 with CPU E5-2699v3, E5-2697v3, E5-2667v3, and E5-2637v3 installed.

Table 1-2 Maximum and Minimum Configuration

Items		Configuration	
		Minimum	Maximum
Base unit	Front panel	1	1
	Fan module	6	6
Server blade		1	8
Switch module		0	4
Management module		1	2
Power supply module		1	4

Modules

This subsection provides locations of modules in the server chassis.

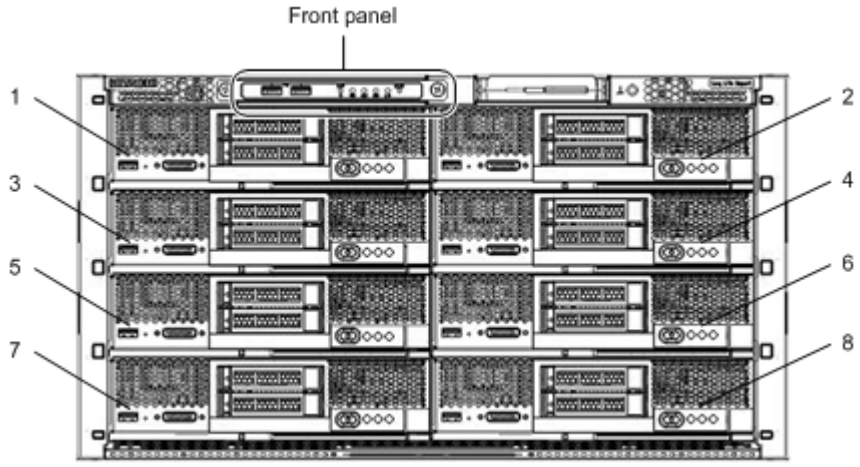

Figure 1-2 Front view

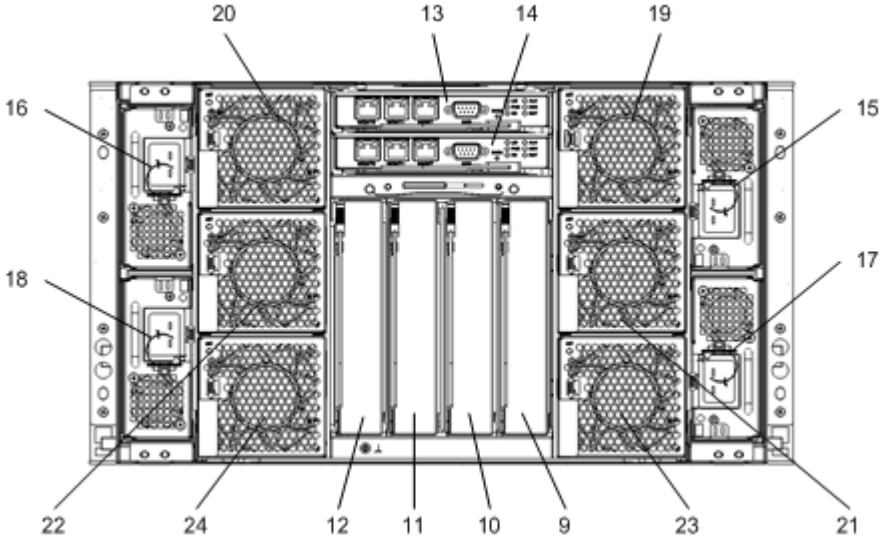

Figure 1-3 Rear view

Table 1-3 Server Chassis Modules

Location	Component	Location	Component
1	Server blade #0	13	Management module #0
2	Server blade #1	14	Management module #1
3	Server blade #2	15	Power supply module #0
4	Server blade #3	16	Power supply module #1
5	Server blade #4	17	Power supply module #2
6	Server blade #5	18	Power supply module #3
7	Server blade #6	19	Fan module #0
8	Server blade #7	20	Fan module #1
9	Switch module #0	21	Fan module #2

Location	Component	Location	Component
10	Switch module #1	22	Fan module #3
11	Switch module #2	23	Fan module #4
12	Switch module #3	24	Fan module #5

Management Monitor for Maintenance

The Hitachi Compute Blade system provides two types of management monitor.

- Web console
- LCD touch console

Web Console

The Web console is a general application to control or manage the Hitachi Compute Blade system. By connecting between the management module installed in the system and the user system console on the network, you can display the system status and failed parts, and set up the configuration.

The Web console is connected to the management LAN port #0 on management module. The management LAN port #0 is a standard RJ45 connector and accepts both a cross-over cable and straight-through cable.

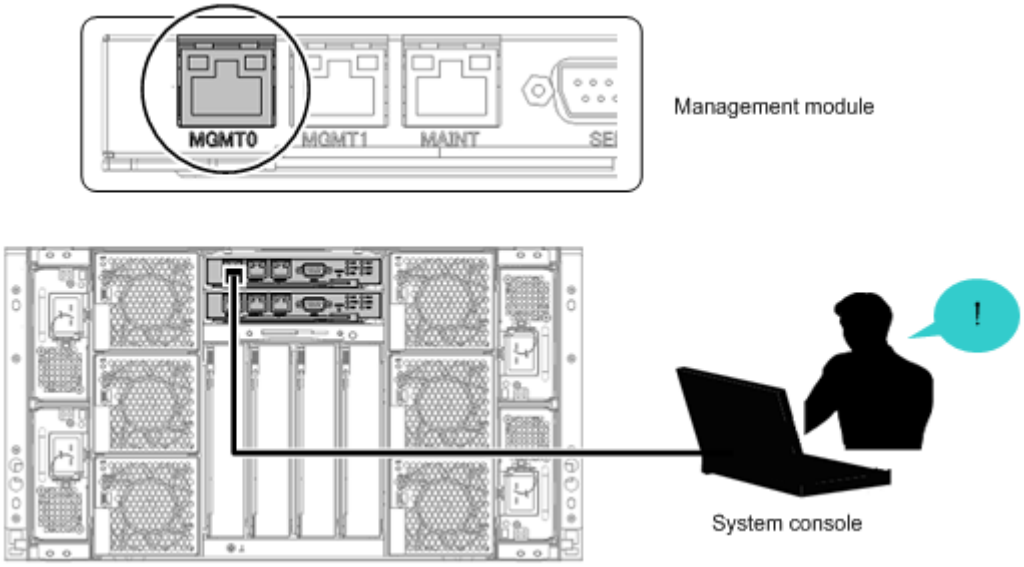

Figure 1-4 Connecting the system console

LCD Touch Console

A LCD touch console unit is the optional product. Connecting it to USB port of the front panel in server chassis, it is easy to display the system status and failed parts, and set up the configuration without a system console and Web console application.

Hitachi recommends that the LCD touch console be available for secondary maintenance application.

The LCD touch console is directly connected to the USB port #0 or 1 on front panel module. The USB ports are standard USB connectors.

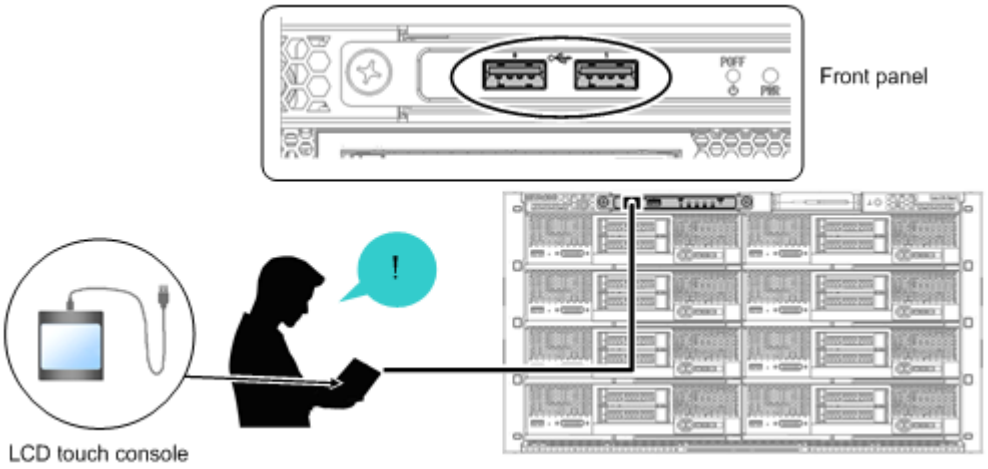

Figure 1-5 Connecting the LCD touch console

Hot-swappable Modules

All modules are designed to be hot-swappable. The following figure shows the side of the server chassis from which hot-swap is performed for each module.

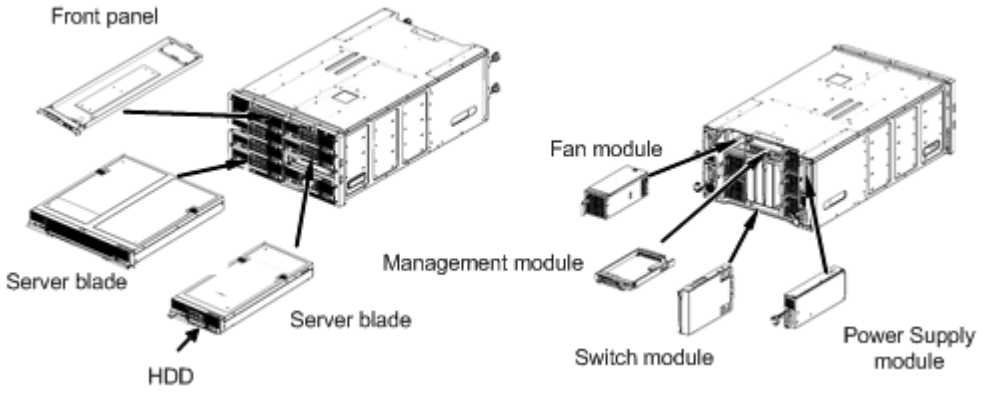

Figure 1-6 Hot-swappable Modules

Power Distribution

One power cable is required per power supply module. (Four power cables maximum) In the basic configuration, power cables from a server chassis connect to a distribution box, and the distribution box is connected to the power outlet. Hitachi recommends that power outlets use NEMA L6-30R (30 A/250 V) or IEC60309-32 (32A/240V) receptacles.

For more information, see;

– *Hitachi Compute Blade 500 Series Site Planning Guide*

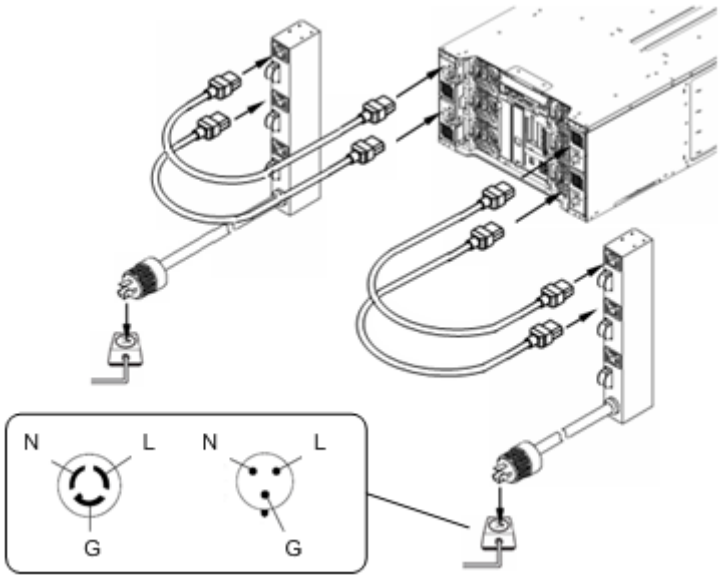

Figure 1-7 Power Distribution

Table 1-4 Specifications of the Power Outlet Plug and Receptacle

Items	Regulation	Power Rating	Description	Type and capacity	Electrical plug and receptacle	
					Plug	Receptacle
1	North America	200-240 V	200-240 VAC distribution box	30 A – 250 V Grounded 2-poles/3-wires	 (NEMA L6-30P)	 (NEMA L6-30R)
2	International	240 V	200-240 VAC distribution box	32 A – 250 V Grounded 2-poles/3-wires	 (IEC309 Plug)	 (IEC309 Socket)

Power Cable

A power cable connects a power supply module to a distribution box.

- Power supply module side: IEC60320-C19
- Distribution box side: IEC60320-C20

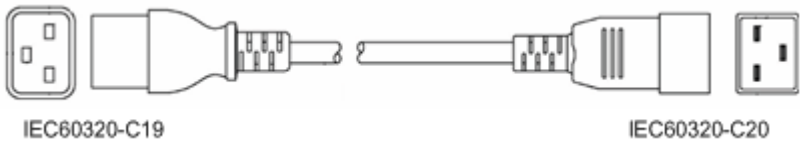

Figure 1-8 Power Cable

Identification

Server chassis and server blades each come with ID tags to facilitate identification during installation and maintenance.

The ID tag enables identification of the model name, serial number, and revision of the target before maintenance is performed, allowing errors in maintenance to be avoided.

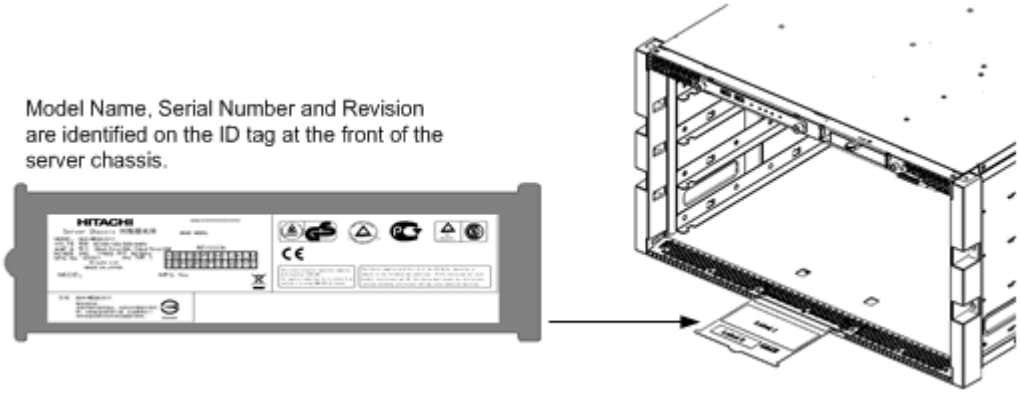

Figure 1-9 ID Tag

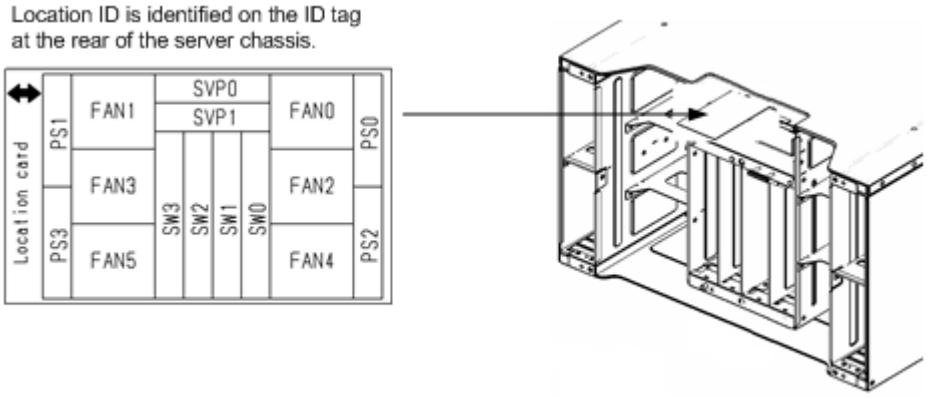

Figure 1-10 Location ID

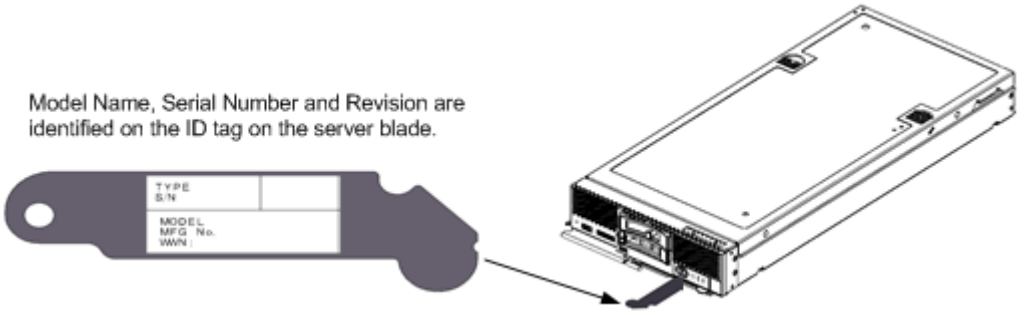

Figure 1-11 Label Tag

Switches, Indicators and Connectors

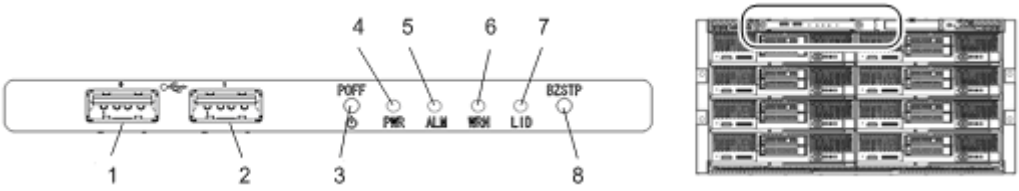

Figure 1-12 Front panel

Table 1-5 Front panel Switches, Indicators and Connectors

Location	Name	State	Description
1	USB port 0 (USB0)	-	Server chassis USB ports.
2	USB port 1 (USB1)	-	
3	Forced power off switch (POFF)	-	Press and hold for at least four seconds to force the main power off.
4	Power LED (PWR)	Green-On	Main power of one or more server blades is on.
		Green-Blink	The server chassis is shut down by the management module.
		Amber-On	Main power of all the server blades is off.
		Amber-Blink	Initialization when the power is first supplied to the server chassis.
5	Alarm LED (ALM)	Red -On	Alarm, the server chassis found a non redundant failure.
6	Warning LED (WRN)	Amber-On	Warning, a failure was detected in one or more modules.
7	Identify LED (LID)	Blue-On	The server chassis is identified.
8	Buzzer stop switch (BZSTP)	-	Stops the buzzer

Server Blade

This section describes server blades.

Overview

The CB 500 server blade offers the following key features:

- High-performance Intel multi-core processor with QPI technology for high-throughput and low-latency.
- High reliability functions through the processor, memory and HDD reliability/availability/maintainability features, such as memory scrubbing (self-error-correcting), memory mirroring function (memory duplication), and integrated Hardware RAID 1.
- High density, high performance optimized for enterprise data center, virtualization, high-speed computation, and flexible IO capability.

A server blade contains processors, memory, HDDs, and other components, and is available in either of two form factors: the "half-wide" blade; "full-wide" blade. There are also two types of half-wide blades, the "storage expansion" blade for additional HDDs and the "PCI expansion" blade for additional PCI Express cards.

For detailed specifications, see System Unit Specifications on page 2-2.

Table 1-6 Function and Model Names

Form factor		Number of processors	Size (W x D x H: mm)
Half-wide blade	CB 520A A1, CB 520H A1/B1/B2	2	215.4 x 492.7 x 51.1
	CB 520H B3		215.4 x 500.6 x 51.1
Storage expansion blade		0	435.3 x 492.7 x 55.5
PCI expansion blade		0	435.3 x 492.7 x 55.5
Full-wide blade	CB 540A A1/B1	4	435.3 x 492.7 x 55.5
	CB 520X B1/B2	2	

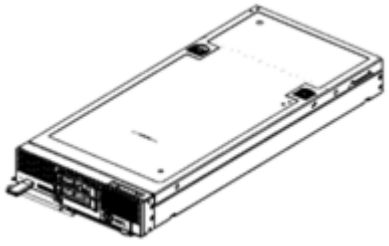

Figure 1-13 Half-wide Blade

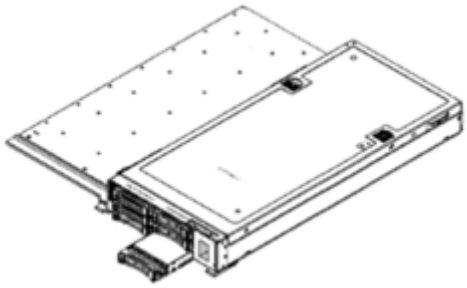

Figure 1-14 Storage Expansion Blade

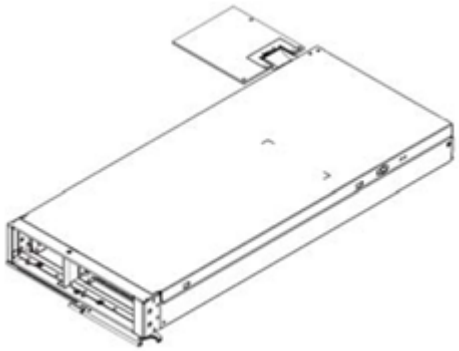

Figure 1-15 PCI Expansion Blade

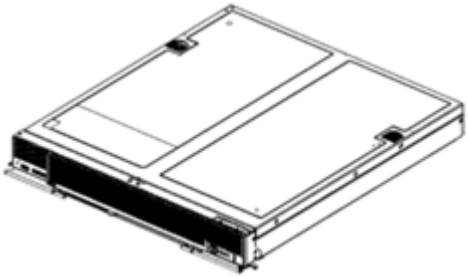

Figure 1-16 Full-wide Blade

With CB 520X B1/B2, you can connect two server blades using the 2-blade SMP connection board to create SMP configuration with four CPUs and you can connect four server blades using the 4-blade SMP connection board to create SMP configuration with eight CPUs shown in the following figure. SMP function stands for Symmetric Multi Processing (SMP) between server blades.

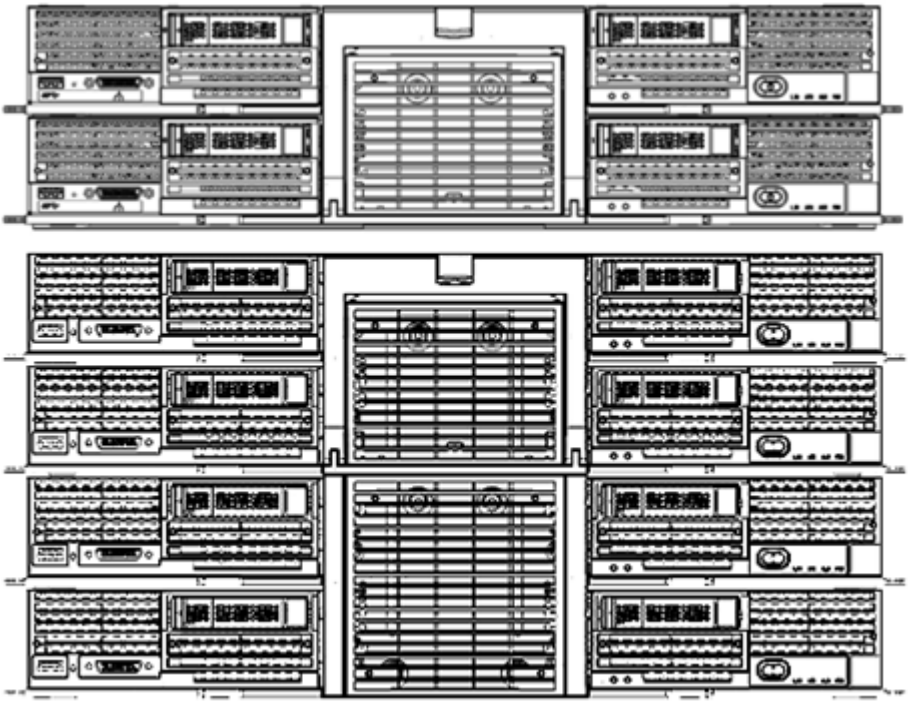

Figure 1-17 Full-wide Blade (CB 520X B1/B2)

Switches, Indicators and Connectors (Half-wide blade CB 520A A1/CB 520H A1/CB 520H B1/B2)

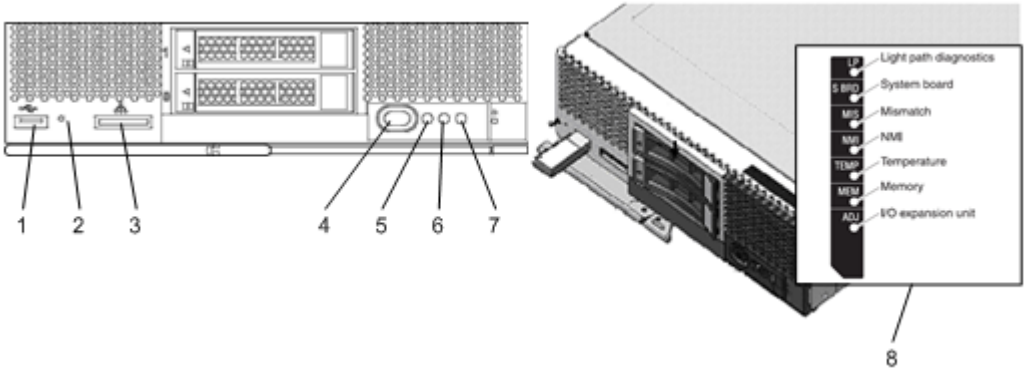

Figure 1-18 Server Blade (Half-wide blade CB 520A A1/CB 520H A1/CB 520H B1/B2)

Table 1-7 Server Blade Switches, Indicators and Connectors (Half-wide blade CB 520A A1/CB 520H A1/CB 520H B1/B2)

Location	Name	State	Description
1	USB port	-	USB port in the server blade.

Location	Name		State	Description
2	NMI reset switch		-	Press this switch to issue a Non-Maskable Interrupt (NMI) of the server blade.
3	KVM port		-	Provides VGA, serial port and 2 USB port outputs. Connect a KVM cable to this port.[1]
4	Power switch with Power LED		-	Press this switch to power-on. Press and hold this switch for four seconds or more to force the main power-off.[2]
			Green-On	Main power of the server blade is turned on.
			Green-Blink	Main power of the server blade is turned off. Slow blink: The server blade is ready to be turned on. Rapid blink: The server blade is initializing.
5	Location Identify LED (LID)		Blue-On	Identifies the server blade.
6	Attention LED (ATN)		Amber-On	Configuration mismatch errors other than failures are detected in the server blade, such as the installed Mezzanine card does not correspond to or does not support the switch module. Indicates explicitly that the power button with LED was pressed. The LED is turned on when you press the power button, and then turned off when the main power is turned on.[3]
7	Alarm LED (ALM)		Amber-On	Indicates a fault that requires an HDD to be exchanged was detected in the server blade.
8	Diagnostic Panel	LP	Green-On	The LED panel on the diagnostic panel is active.
		S BRD	Amber-On	The motherboard needs to be replaced.
		MIS	Amber-On	Unsupported combination of the DIMM, CPU, and HDD.

Location	Name		State	Description
		NMI	Amber-On	A Non-Maskable Interrupt (NMI) was generated.
		TEMP	Amber-On	The maximum temperature limit was exceeded.
		MEM	Amber-On	A memory failure was detected.
		ADJ	-	Not supported.

Notes:

1. When using the USB port of KVM cable except keyboard and mouse, you should use the device with a rated maximum current limit 500 mA per two ports, or the USB device that can be external powered.
2. When POWER LED starts blinking from lighting solid, release the button. If you press the power switch for six seconds or more, the power may turn on after forced turn-off. If so, check that HDD access LED is not illuminated, and then press and hold the power button for four seconds or more.
3. Error cannot be displayed while from pressing the power button until turning on the main power.

Switches, Indicators and Connectors (Half-wide blade CB 520H B3)

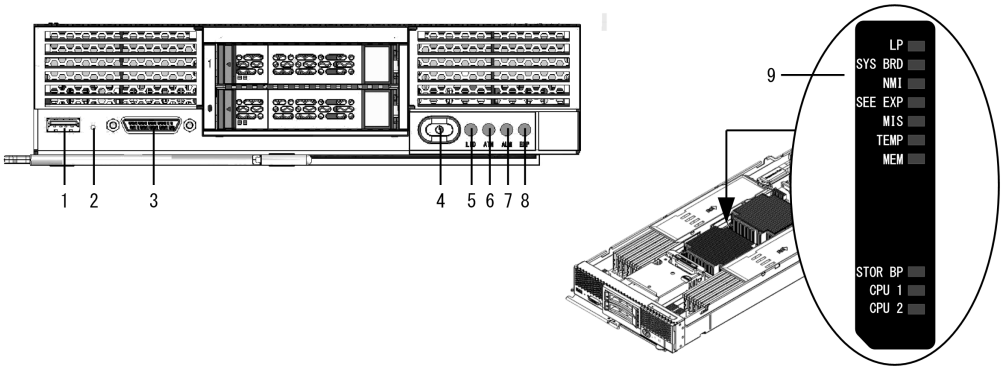

Figure 1-19 Server Blade (Half-wide blade CB 520H B3)

Table 1-8 Server Blade Switches, Indicators and Connectors (Half-wide blade CB 520H B3)

Location	Name	State	Description
1	USB port	-	USB port in the server blade.
2	NMI reset switch	-	Press this switch to issue a Non-Maskable Interrupt (NMI) of the server blade.
3	KVM port	-	Provides VGA, serial port and 2 USB port outputs.

Location	Name		State	Description
				Connect a KVM cable to this port.[1]
4	Power switch with Power LED		-	Press this switch to power-on. Press and hold this switch for four seconds or more to force the main power-off.[2]
			Green-On	Main power of the server blade is turned on.
			Green-Blink	Main power of the server blade is turned off. Slow blink: The server blade is ready to be turned on. Rapid blink: The server blade is initializing.
5	Location Identify LED (LID)		Blue-On	Identifies the server blade.
6	Attention LED (ATN)		Amber-On	Configuration mismatch errors other than failures are detected in the server blade, such as the installed Mezzanine card does not correspond to or does not support the switch module. Indicates explicitly that the power button with LED was pressed. The LED is turned on when you press the power button, and then turned off when the main power is turned on.[3]
7	Alarm LED (ALM)		Amber-On	Indicates a fault that requires an HDD to be exchanged was detected in the server blade.
8	Expansion LED		Amber-On	Indicates a fault that requires an expansion blade to be exchanged was detected.
9	Diagnostic LED	LP	Green-On	The LED panel is active.
		SYS BRD	Amber-On	The motherboard needs to be replaced.
		NMI	Amber-On	A Non-Maskable Interrupt (NMI) was generated.
		SEE EXP	Amber-On	Not supported

Location	Name		State	Description
		MIS	Amber-On	Unsupported combination of the DIMM, CPU, and HDD.
		TEMP	Amber-On	The maximum temperature limit was exceeded.
		MEM	Amber-On	A memory failure was detected.
		STOP BP	Amber-On	SAS Backplane failure was detected.
		CPU1	Amber-On	CPU1 failure was detected.
		CPU2	Amber-On	CPU2 failure was detected.

Notes:

1. When using the USB port of KVM cable except keyboard and mouse, you should use the device with a rated maximum current limit 500 mA per two ports, or the USB device that can be external powered.
2. When POWER LED starts blinking from lighting solid, release the button. If you press the power switch for six seconds or more, the power may turn on after forced turn-off. If so, check that HDD access LED is not illuminated, and then press and hold the power button for four seconds or more.
3. Error cannot be displayed while from pressing the power button until turning on the main power.

Switches, Indicators and Connectors (Full-wide blade)

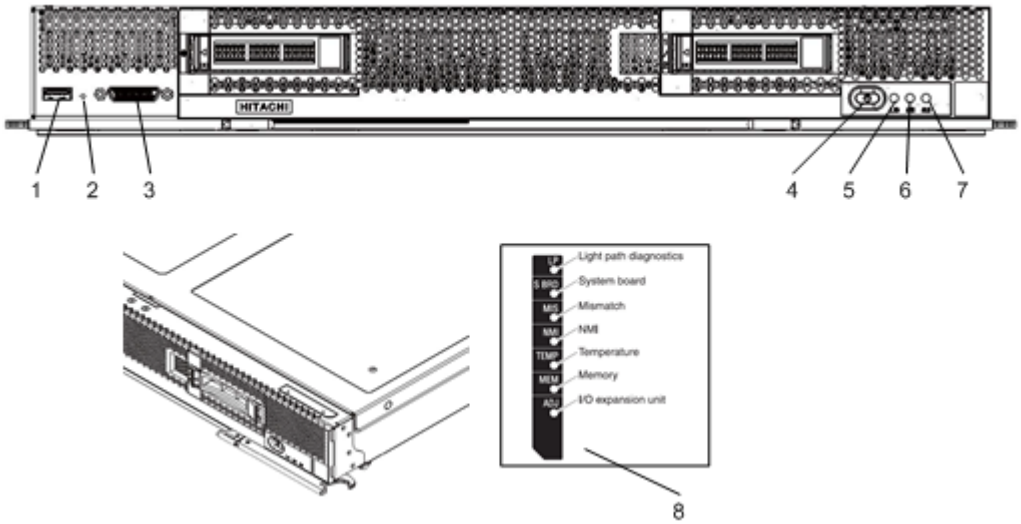

Figure 1-20 Server Blade

Table 1-9 Server Blade Switches, Indicators and Connectors

Location	Name		State	Description
1	USB port		-	USB port in the server blade.
2	NMI reset switch		-	Press this switch to issue a Non-Maskable Interrupt (NMI) of the server blade.
3	KVM port		-	Provides VGA, serial port and 2 USB port outputs. Connect a KVM cable to this port.[1]
4	Power switch with Power LED		-	Press this switch to power-on. Press and hold this switch for four seconds or more to force the main power-off.[2]
			Green-On	Main power of the server blade is turned on.
			Green-Blink	Main power of the server blade is turned off. Slow blink: The server blade is ready to be turned on. Rapid blink: The server blade is initializing.
5	Location Identify LED (LID)		Blue-On	Identifies the server blade.
6	Attention LED (ATN)		Amber-On	Configuration mismatch errors other than failures are detected in the server blade, such as the installed Mezzanine card does not correspond to or does not support the switch module. Indicates explicitly that the power button with LED was pressed. The LED is turned on when you press the power button, and then turned off when the main power is turned on.[3]
7	Alarm LED (ALM)		Amber-On	Indicates a fault that requires an HDD to be exchanged was detected in the server blade.
8	Diagnostic Panel	LP	Green-On	The LED panel is active.
		S BRD	Amber-On	The motherboard needs to be replaced.

Location	Name		State	Description
		MIS	Amber-On	Unsupported combination of the DIMM, CPU, and HDD.
		NMI	Amber-On	A Non-Maskable Interrupt (NMI) was generated.
		TEMP	Amber-On	The maximum temperature limit was exceeded.
		MEM	Amber-On	A memory failure was detected.
		ADJ	-	Not supported.

Notes:

1. When using the USB port of KVM cable except keyboard and mouse, you should use the device with a rated maximum current limit 500 mA per two ports, or the USB device that can be external powered.
2. When POWER LED starts blinking from lighting solid, release the button. If you press the power switch for six seconds or more, the power may turn on after forced turn-off. If so, check that HDD access LED is not illuminated, and then press and hold the power button for four seconds or more.
3. Error cannot be displayed while from pressing the power button until turning on the main power.

Switches, Indicators and Connectors (Full-wide blade CB 520X B1/B2)

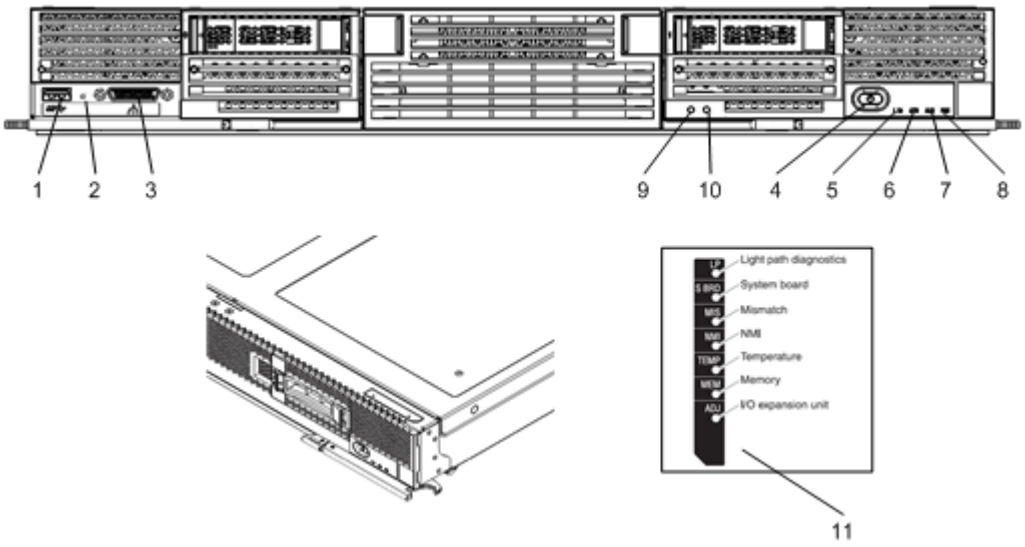

Figure 1-21 Server Blade (CB 520X B1/B2)

Table 1-10 Server Blade Switches, Indicators and Connectors

Location	Name	State	Description
1	USB	-	USB port in the server blade.
2	NMI Reset Switch	-	Press this switch to issue a Non-Maskable Interrupt (NMI) of the server blade.
3	KVM	-	Provides VGA, serial port and 2 USB port outputs. Connect a KVM cable to this port.[1]
4	Enclosure Power LED with Integrated Power Switch	-	Press this switch to power-on. Press and hold this switch for four seconds or more to force the main power-off.[2]
		Green-On	Main power of the server blade is turned on.
		Green-Blink	Main power of the server blade is turned off. Slow blink: The server blade is ready to be turned on. Rapid blink: The server blade is initializing.
5	Enclosure Identify LED	Blue-On	Identifies the server blade.
6	Error Log LED	Amber-On	Configuration mismatch errors other than failures are detected in the server blade, such as the installed Mezzanine card does not correspond to or does not support the switch module. Indicates explicitly that the power button with LED was pressed. The LED is turned on when you press the power button, and then turned off when the main power is turned on.[3]
7	Enclosure Fault LED	Amber-On	Indicates a fault that requires an HDD to be exchanged was detected in the server blade.
8	Primary LED	White-On	Indicates this is the primary server blade.
9	QPI Link Fault LED (ERR)	Amber-On	An error occurred in QPI link in SMP configuration.

Location	Name		State	Description
10	QPI Link Status LED (LNK)		Green-On	QPI is linked in SMP configuration.
11	Diagnostic Panel	LP	Green-On	The LED panel is active.
		S BRD	Amber-On	The motherboard needs to be replaced.
		MIS	Amber-On	Unsupported combination of the DIMM, CPU, and HDD.
		NMI	Amber-On	A Non-Maskable Interrupt (NMI) was generated.
		TEMP	Amber-On	The maximum temperature limit was exceeded.
		MEM	Amber-On	A memory failure was detected.
		ADJ	-	Not supported.

Notes:

1. When using the USB port of KVM cable except keyboard and mouse, you should use the device with a rated maximum current limit 500 mA per two ports, or the USB device that can be external powered.
2. When POWER LED starts blinking from lighting solid, release the button. If you press the power switch for six seconds or more, the power may turn on after forced turn-off. If so, check that HDD access LED is not illuminated, and then press and hold the power button for four seconds or more.
3. Error cannot be displayed while from pressing the power button until turning on the main power.

HDD slot, order of installation, and indicator

HDD slot and order of installation

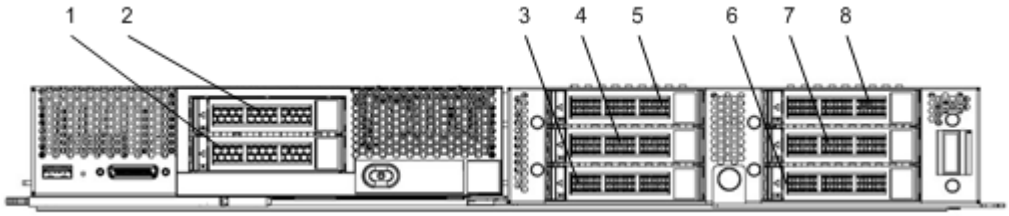

Figure 1-22 Half-wide Blade

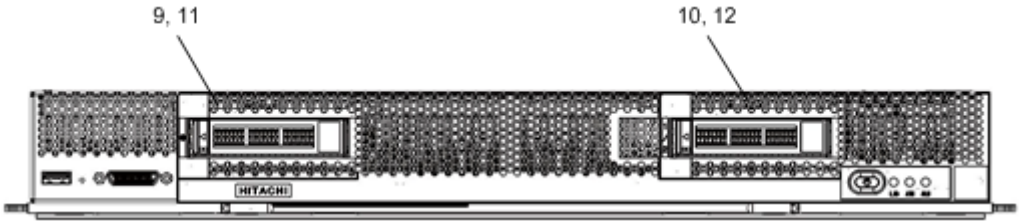

Figure 1-23 Full-wide Blade

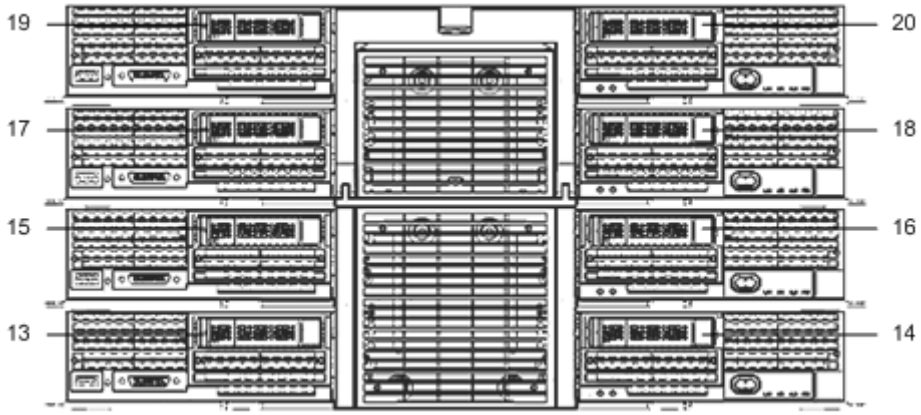

Figure 1-24 Full-wide Blade (CB 520X B1/B2)

Table 1-11 HDD slot and order of installation

Location	Form factor		Slot	Order of installation
1	Half-wide blade		HDD slot 0	1
2			HDD slot 1	2
3	Storage expansion blade		HDD expansion slot 0	1
4			HDD expansion slot 1	2
5			HDD expansion slot 2	3
6			HDD expansion slot 4	4
7			HDD expansion slot 5	5
8			HDD expansion slot 6	6
9	Full-wide blade	LSI SAS 2008	HDD slot 0	1
10			HDD slot 1	2
11		LSI SAS 2004	HDD slot 0	1
12			HDD slot 2	2
13		SMP configuration	HDD slot 0	1
14			HDD slot 1	1
15			HDD slot 0	2

Location	Form factor		Slot	Order of installation
16			HDD slot 1	2
17			HDD slot 0	3
18			HDD slot 1	3
19			HDD slot 0	4
20			HDD slot 1	4

Indicators

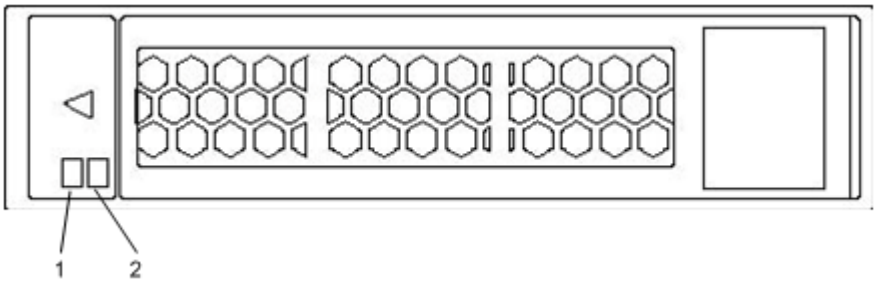

Figure 1-25 Indicators

Table 1-12 Indicators for SAS HDD/SAS SSD

Location	Name	State	Description
1	Active LED	Green-On	SAS drive is in idle status.
		Green-Blink	SAS drive is in either start, active, or rebuilding as the source drive status.
2	Fault LED	Amber-On	An error occurs in SAS drive[1].
		Amber-Blink	SAS drive is in rebuilding as the source drive status.

Notes:

1. The LED may be turned on due to initializing after activating. However, this situation is not error when the LED is turned off about a minute later. If the LED is not turned off, contact the sales representative or maintenance personnel.

Table 1-13 Indicators for SATA HDD

Location	Name	State	Description
1	Active LED	Green-Blink	SATA drive is accessed; the source drive is used for rebuilding.
2	Fault LED	Amber-On	An error occurs in the drive.

PCI slots

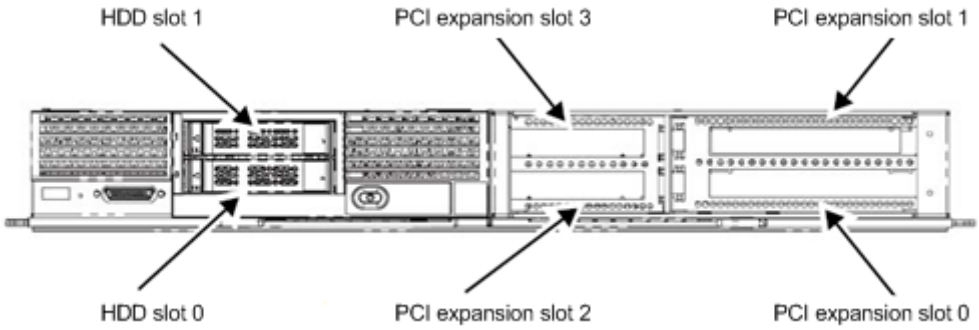

Figure 1-26 PCI slots

Tip: PCI expansion slot 4 is behind PCI expansion slot 2. PCI expansion slot 5 is behind PCI expansion slot 3. Both PCI expansion slot 4 and PCI expansion slot 5 are internal slots of the PCI expansion blade.

Management Module

This section describes the management module.

Overview

The management module provides power control of the modules, status monitoring, system console, and management network functions. One (standard) or two (maximum) management modules can be mounted in a server chassis. With two management modules installed, the modules provide a redundant configuration. One is the primary module and the other is the secondary module.

To set up the management module configuration, see:

- *Hitachi Compute Blade 500 Series Management Module Setup Guide*

Switches, Indicators and Connectors

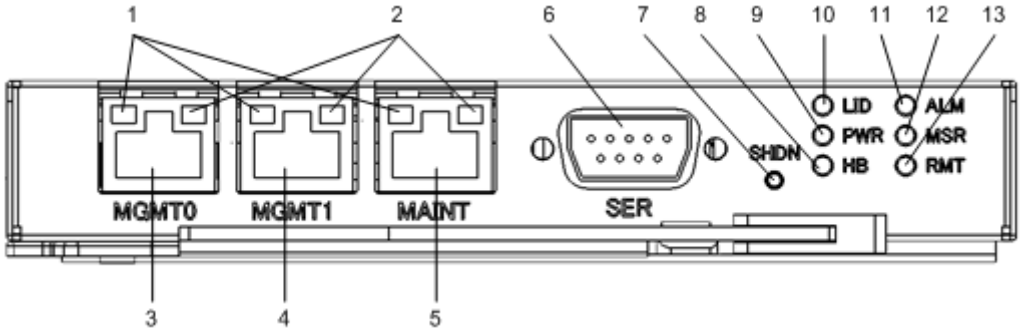

Figure 1-27 Management Module

Table 1-14 Management Module Switches, Indicators and Connectors

Location	Name	State	Description
1	LAN Link Speed LED	Yellow-On	1000BASE-T
		Yellow-Blink	Link communication.
		Green-On	100BASE-TX
		Green-Blink	Link communication.
		Off	10BASE-T or no link.
2	LAN Status LED	Green-On	Link established.
		Green-Blink	Link communication.
3	Management LAN Port #0 (MGMT0)	-	LAN port 0 for the management network
4	Management LAN Port #1 (MGMT1)	-	LAN port 1 for the management network
5	Maintenance LAN Port (MAINT)	-	LAN port for maintenance
6	Serial Port (SER)	-	Serial port for the management module console.
7	Shut Down switch (SHDN)	-	Press and hold for at least four seconds to turn off the power.
8	Heartbeat LED (HB)	Green-Blink	F/W is active and working normally
9	Power LED (PWR)	Green-On	Powered-on, normal operation.
		Green-Blink	The system is shutting down or booting
10	Identify LED (LID)	Blue-On	This module is identified.
11	Alarm LED (ALM)	Red-On	Alarm, an error was detected
12	Primary LED (MSR)	Green-On	This module is currently active. i.e. not standby
13	Remote LED (RMT)	Green-On	The management module is accessed remotely.

Switch Module

This section describes switch modules.

Overview

The backplane within the server chassis interconnects the switch module to the server blades. Each server blade connects to the backplane and thus to the switch modules through an onboard CNA or Mezzanine cards on the server blade.

The following shows the rules for installing the modules:

The Mezzanine card on the server blade must match precisely the switch modules to which it connects for successful activation. Any mismatch will be detected as a configuration error.

- A Mezzanine card installed in mezzanine slot 1 of CB 520H A1 or CB 520A A1 connects to the switch modules installed in switch slots 0 and 1.
- An onboard CNA in the CB 520H B1/B2/B3 connects to the switch modules installed in switch slots 0 and 1.
- A Mezzanine card installed in mezzanine slot 2 of CB 520H A1/B1/B3 or CB 520A A1 connects to the switch modules installed in switch slots 2 and 3.

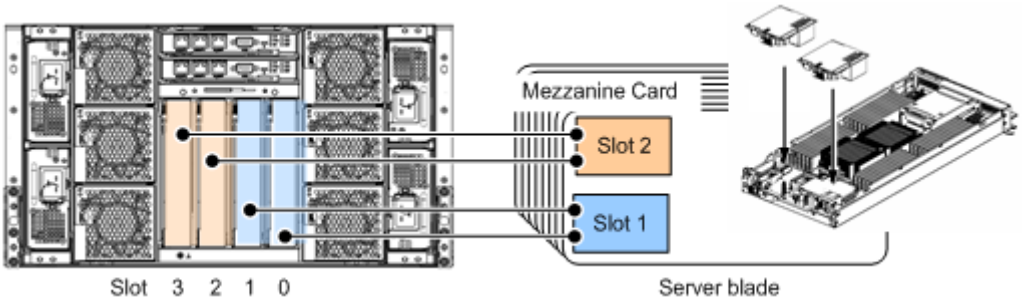

Figure 1-28 Relationship between Mezzanine Card and Switch Module (CB 520H A1, CB 520A A1)

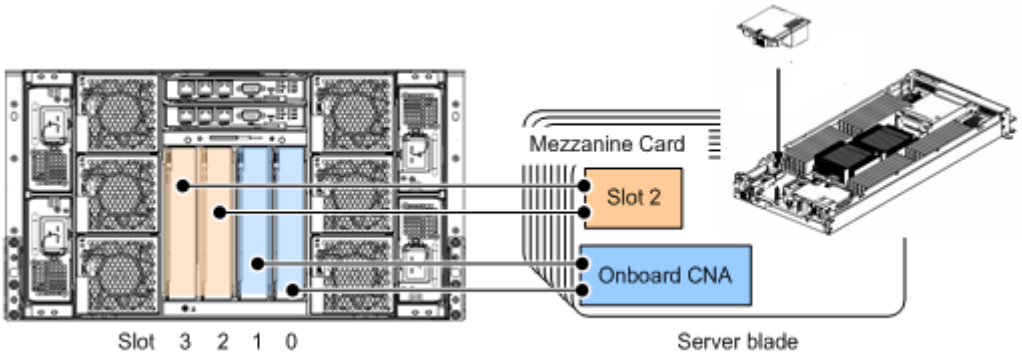

Figure 1-29 Relationship between Mezzanine Card and Switch Module (CB 520H B1/B2/B3)

- Mezzanine cards installed in mezzanine slot 1 and slot 3 of CB 540A A1 connect to switch modules installed in switch module slot 0 and slot 1.
- Onboard CNAs 1 and 2 in the CB 540A B1 connect to the switch modules installed in switch slots 0 and 1.
- Mezzanine cards installed in mezzanine slot 2 and slot 4 of CB 540A A1 or B1 connect to switch modules installed in switch module slot 2 and slot 3.

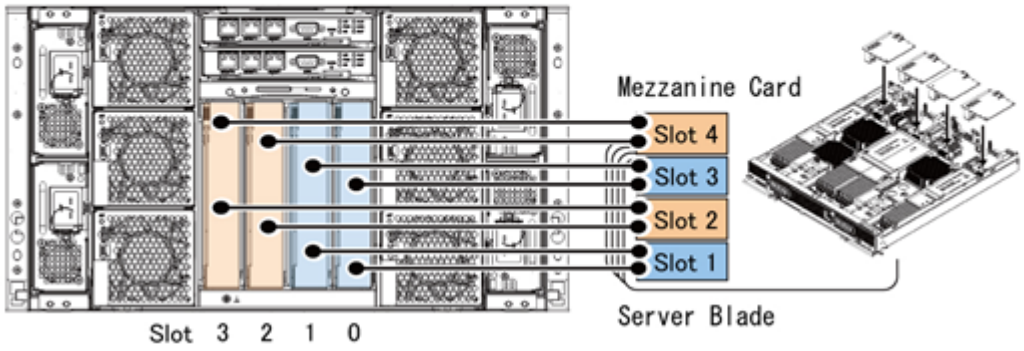

Figure 1-30 Relationship between Mezzanine Card and Switch Module (CB 540A A1)

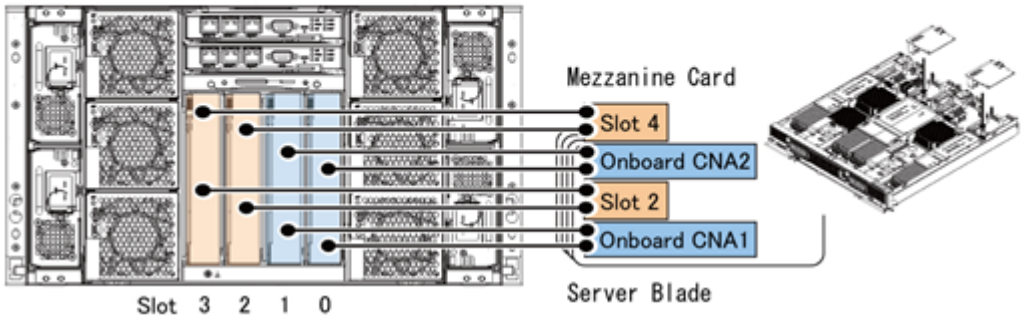

Figure 1-31 Relationship between Mezzanine Card and Switch Module (CB 540A B1)

- Mezzanine cards installed in mezzanine slot 2 and slot 4 of CB 520X B1/B2 connect to switch modules installed in switch module slot 2 and slot 3.
- Onboard CNA 1 in the CB 520X B1/B2 connects to the switch modules installed in switch slots 0 and 1.

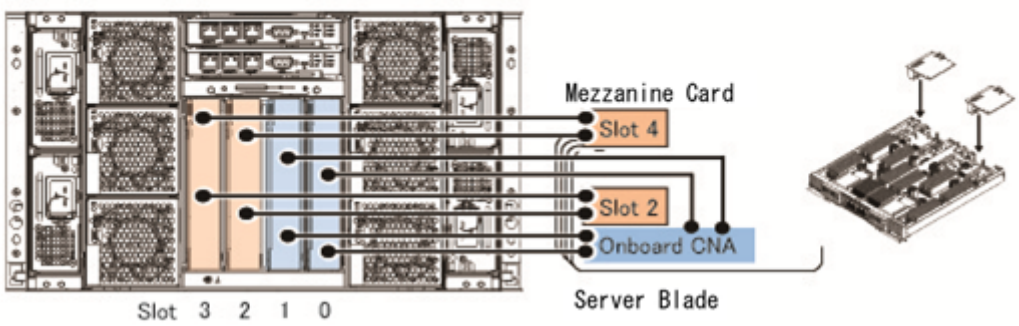

Figure 1-32 Relationship between Mezzanine Card and Switch Module (CB 520X B1/B2)

Table 1-15 Switch Module form-factors

Form factor	Size (W x D x H: mm)	Available
Single-width	32.3 x 252 x 161	Yes

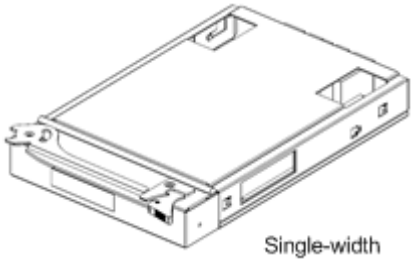

Figure 1-33 Switch Module

User ports

All external ports of a switch module are available even if only one server blade is installed.

To set up the switch module configuration, see Switch Module Specifications on page 2-15.

The following is the number of useful user ports.

Table 1-16 Number of usable User Ports

Switch module type		Number of installed switch modules			
		One	Two	Three	Four
1 Gb/sec LAN switch module	20 ports	4	8	12	16
	40 ports	8	16	24	32

Switch module type		Number of installed switch modules			
		One	Two	Three	Four
1/10 Gb/sec LAN switch module	1 Gb/sec ports	4	8	12	16
	10 Gb/sec ports	2	4	6	8
1 Gb/sec LAN pass-through module		16	32	48	64
10 Gb/sec LAN pass-through module		16	32	48	64
10 Gb/sec DCB switch module		8	16	24	32
8 Gb/sec FC switch module		6	12	N/A	N/A
16 Gb/sec FC switch module		8	16	N/A	N/A

Switches, Indicators and Connectors

1 Gb/sec LAN Switch Module (20 ports)

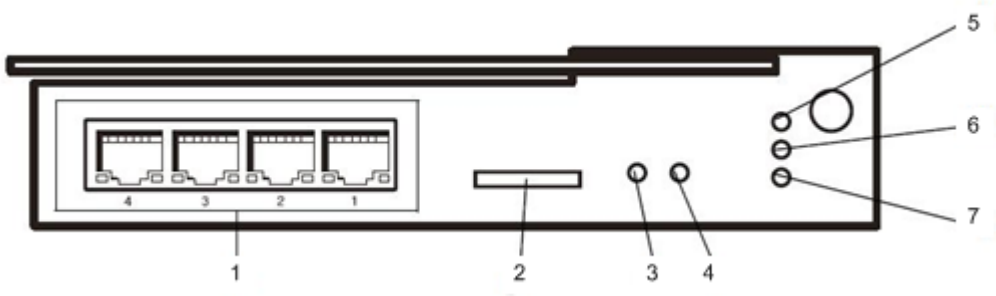

Figure 1-34 1 Gb/sec LAN Switch Module (20 ports)

Table 1-17 1 Gb/sec LAN Switch Module (20 ports) Switches, Indicators and Connectors

Location	Name	State	Description
1	LAN ports 1 to 4	Green-On	Link established.
		Green-Blink	Link communication.
		Amber-On	Link failed.
2	Memory Card slot (MC)	-	Slot for an SD memory card.
3	Access LED (ACC)	Green-On	The SD memory card is accessed.
4	Reset switch (RST)	-	Press and hold for five seconds to reset the LAN switch module.
5	Power LED (PWR)	Green-On	Powered-on, normal operation.
6	Status1 LED (ST1)	Green-On	Normal operation.
		Green-Blink	Power-on diagnosis or software activation.

Location	Name	State	Description
		Red-Blink	Fault. Max. temperature limit exceeded or other warning.
		Red-On	Alarm.
7	Identify LED (LOCID)	Blue-On	The switch module is identified.

1 Gb/sec LAN Switch Module (40 ports)

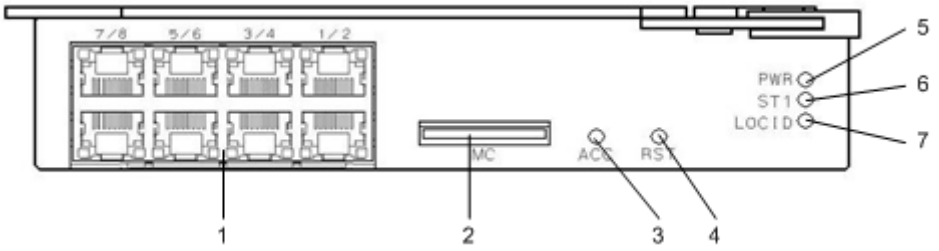

Figure 1-35 1 Gb/sec LAN Switch Module (40 ports)

Table 1-18 1 Gb/sec LAN Switch Module Switches (40 ports), Indicators and Connectors

Location	Name	State	Description
1	LAN ports 1 to 8	Green-On	Link established.
		Green-Blink	Link communication.
		Amber-On	Link failed.
2	Memory Card slot (MC)	-	Slot for an SD memory card.
3	Access LED (ACC)	Green-On	The SD memory card is accessed.
4	Reset switch (RST)	-	Press and hold for five seconds to reset the LAN switch module.
5	Power LED (PWR)	Green-On	Powered-on, normal operation.
6	Status1 LED (ST1)	Green-On	Normal operation.
		Green-Blink	Power-on diagnosis or software activation.
		Red-Blink	Fault. Max. temperature limit exceeded or other warning.
		Red-On	Alarm.
7	Identify LED (LOCID)	Blue-On	The switch module is identified.

1/10 Gb/sec LAN Switch Module

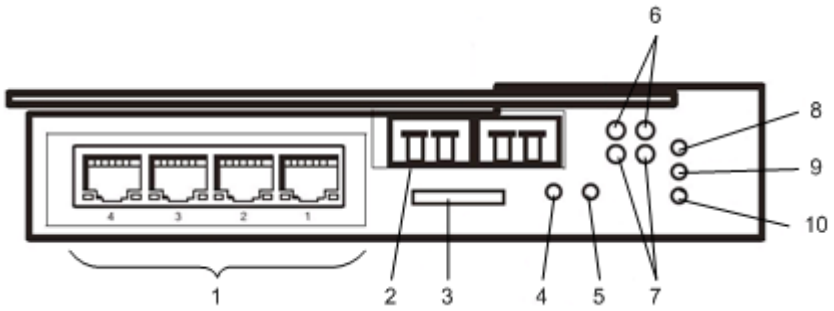

Figure 1-36 1/10 Gb/sec LAN Switch Module

Table 1-19 1/10 Gb/sec LAN Switch Module Switches, Indicators and Connectors

Location	Name	State	Description
1	LAN ports 1 to 4	Green-On	Link established.
		Green-Blink	Link communication.
		Amber-On	Link failed.
2	10GBASE-R slots	-	Slots for 10GBASE-LR or 10GBASE-SR transceivers. Each slot has both link and activity LEDs to the side.
3	Memory Card slot (MC)	-	Slot for an SD memory card.
4	Access LED (ACC)	Green-On	The SD memory card is accessed.
5	Reset switch (RST)	-	Press and hold for five seconds to reset the LAN switch module.
6	LINK LED for XFP	Green-On	Link established.
		Amber-On	Link failed.
7	TX/RX LED for XFP	Green-On	Link communication.
8	Power LED (PWR)	Green-On	Powered-on, normal operation.
9	Status1 LED (ST1)	Green-On	Normal operation.
		Green-Blink	Power-on diagnostics or firmware activation.
		Red-Blink	Fault. Max temperature limit exceeded or other warning.
		Red-On	Alarm.
10	Identify LED (LOCID)	Blue-On	The switch module is identified.

1 Gb/sec LAN Pass-through Module

Figure 1-37 1 Gb/sec LAN Pass-through Module

Table 1-20 1 Gb/sec LAN Pass-through Module Indicators and Connectors

Location	Name	State	Description
1	LAN ports 0 to 15	Green-On	Link established.
		Green-Blink	Link communication
		Amber-On	No link.
2	Identify LED (LOCID)	Blue-On	The LAN pass-through module is identified.
3	Power LED (PWR)	Green-On	Powered-on, normal operation.

10 Gb/sec LAN Pass-through Module

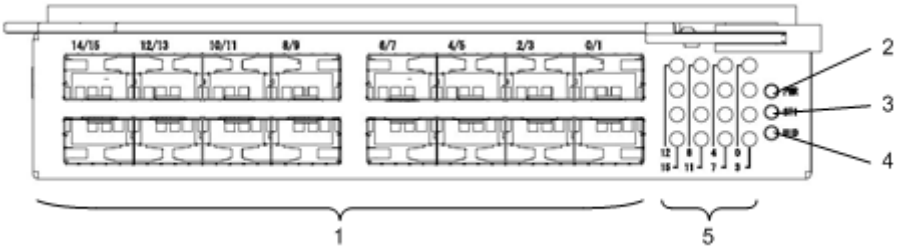

Figure 1-38 10 Gb/sec LAN Pass-through Module

Table 1-21 10 Gb/sec LAN Pass-through Module Indicators and Connectors

Location	Name	State	Description
1	LAN ports 0 to 15	-	By default these ports do not have transceivers installed. The type of transceiver varies according to usage.
2	Power LED (PWR)	Green-On	Powered on normally.
3	Status 1 LED (ST1)	Green-On	Powered on.
		Green-Blink	In initial diagnostics or in initial setting.
		Red-On	An error is detected.

Location	Name	State	Description
		Red-Blink	Warning, such as beyond the upper-limit temperature, is detected.
4	Unique identification LED (UID)	Blue-On	The LAN pass-through module is identified.
5	Port status LED	Green-On	Link established.
		Green-Blink	Link communication
		Amber-On	Link is not established.
		Green / Amber blink by turns	In initial diagnostics or in initial setting.

Brocade 10 Gb/sec DCB Switch Module

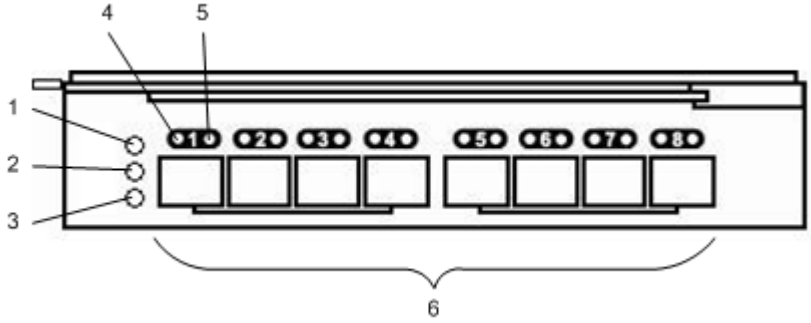

Figure 1-39 Brocade 10 Gb/sec DCB Switch Module

Table 1-22 Brocade 10 Gb/sec DCB Switch Module Switches, Indicators and Connectors

Location	Name	State	Description
1	Identify LED (LOCID)	Blue-On	The switch module is identified
2	Power LED (PWR)	Green-On	Powered-on, normal operation.
3	Status LED	Green-On	Normal operation.
		Green-Blink	Power-on diagnostics or firmware activation.
		Amber-On	Fail.
		Amber-Blink	Warning.
4	Uplink port status LED1	Amber-On	Signal or communication received, but not on line.
		Amber-Blink	Slow blink: Port disabled.
			Rapid blink: Port failed.
5	Uplink port status LED2	Green-On	Online.

Location	Name	State	Description
		Green-Blink	Irregular blink: Link communication.
			Slow blink: LAN interface online, but segmented.
			Rapid Blink: Diagnostic internal loop back.
6	Uplink ports: 1 - 8	-	By default these ports do not have transceivers installed. The type of transceiver varies according to usage.

Brocade 8 Gb/sec Fibre Channel Switch Module

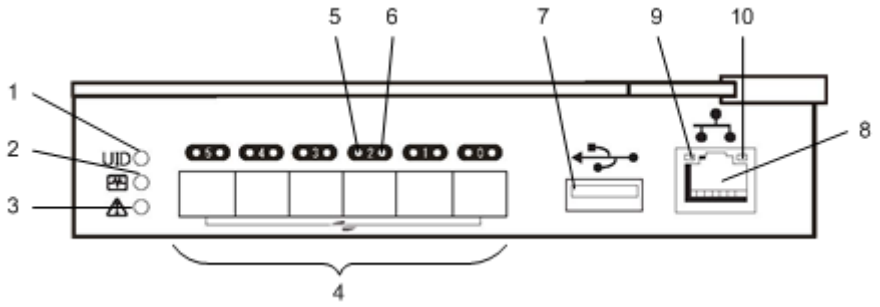

Figure 1-40 Brocade 8 Gb/sec Fibre Channel Switch Module

Table 1-23 Brocade 8 Gb/sec Fibre Channel Switch Module Switches, Indicators and Connectors

Location	Name	State	Description
1	Identify LED (LOCID)	Blue-On	The switch module is identified.
2	Power LED (PWR)	Green-On	Powered-on, normal operation.
3	Status LED	Green-On	Normal operation.
		Green-Blink	Power-on diagnostics or firmware activation.
		Red-Blink	Fault. Max temperature limit exceeded or other warning.
		Red-On	Alarm.
4	FC ports: 0 - 5	-	SFP+ module slots for connection of fibre channel cables
5	Uplink port status LED1	Amber-On	Signal or communication received, but not online.
		Amber-Blink	Slow blink: The port is disabled.
			Rapid blink: The port has failed.
6	Uplink port status LED2	Green-On	FC port is online.

Location	Name	State	Description
		Green-Blink	Slow blink: The FC port is online but segmented.
			Rapid blink: Diagnostic internal loop back.
7	USB port	-	For an optional USB memory device dedicated to fibre channel switch module. Do not connect any other type of device.
8	Management LAN port	-	Management LAN port for the fibre channel switch module. This LAN port is disabled by default.
9	Management LAN port status LED1	Amber-On	Management LAN port is online.
10	Management LAN port status LED2	Green-On	1000 Mbps full duplex.

Brocade 16 Gb/sec Fibre Channel Switch Module

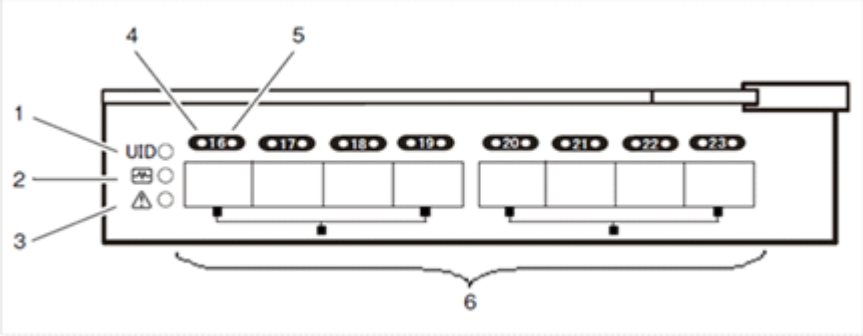

Figure 1-41 Brocade 16 Gb/sec Fibre Channel Switch Module

Table 1-24 Brocade 16 Gb/sec Fibre Channel Switch Module Switches, Indicators and Connectors

Location	Name	State	Description
1	Identify LED (LOCID)	Blue-On	The switch module is identified.
2	Power LED (PWR)	Green-On	Powered-on, normal operation.
3	Status LED	Green-On	Normal operation.
		Green-Blink	Power-on diagnostics or firmware activation.
		Amber-On	Fault.
		Amber-Blink	Alarm.
4	Uplink port status LED1	Green-On	FC port is online.

Location	Name	State	Description
		Green-Blink	Random blink: In link communication
			Slow blink: The FC port is online but segmented.
			Rapid blink: Diagnostic internal loop back.
5	Uplink port status LED2	Amber-On	Signal or communication received, but not online.
		Amber-Blink	Slow blink: The port is disabled.
			Rapid blink: The port has failed.
6	FC ports: 16 - 23	-	External ports

Power Supply Module

This section describes the power supply module.

Indicator and connector

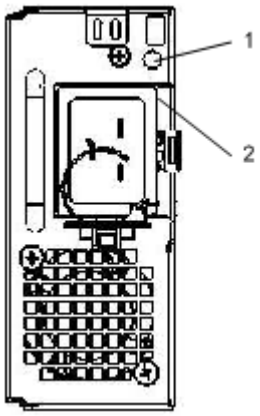

Figure 1-42 Power Supply Module

Table 1-25 Power Supply Module Indicators

Location	Name	State	Description
1	POWER LED (PWR)	Green-On	12 V main power on.
		Green-Blink	12 V main power off, but AC power is present.
		Amber-On	Fail or system shutdown.
		Amber-Blink	No AC power to this power supply, but others are supplied with AC power.
2	Inlet	-	IEC60320-C20 power inlet.

Fan Module

This section describes the fan module.

Indicator

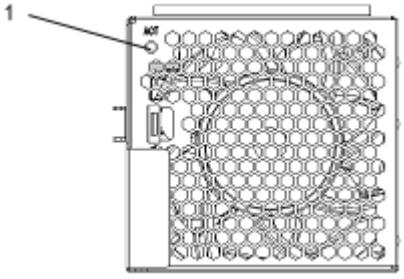

Figure 1-43 Fan Module

Table 1-26 Fan Module Indicators

Location	Name	State	Description
1	Status LED	Green-On	Normal operation.
		Amber-On	Fail.

User Maintenance

Customer replaceable units can be installed or replaced by the user while still under warranty.

The following shows customer replaceable units (CRU).

Table 1-27 Customer replaceable units (CRU)

Location	Replaceable units
Server chassis	Server blade
	Shelf
	Management module
	Lithium battery
	Switch module
	SFP+
	Fan module
	Power supply module
	LCD touch console
	Front panel
	KVM/USB cable

Location	Replaceable units
Server blade	HDD/SSD
	DIMM
	DIMM filler
	Air Duct
	HDD backplane
	Mezzanine card
	Lithium battery
	USB memory (LPAR manager)

For more information, see;

- *Hitachi Compute Blade 500 Series System Service Manual*

Note: Only install or replace units that are specifically allowed for customer replacement. All maintenance must be performed according to;

- *Hitachi Compute Blade 500 Series System Service Manual*

2

Specification

This chapter describes the specifications of the system interface.

- System Unit Specifications
- Interface Port Pin-outs

System Unit Specifications

This section describes specifications for the system unit.

Server Chassis Specifications

The following table provides the server chassis specifications.

Table 2-1 Server Chassis Specifications

Items				Specifications
Enclosure				Rack mount type 6 U
Number of modules that can be installed	Server blades			Up to 8 blades
	Management modules			Up to 2 modules
	Switch modules			Up to 4 modules
		Switch bays #0 and #1		Up to 2 modules Same type of modules must be installed. FC switch module is not available.
		Switch bays #2 and #3		Up to 2 modules Same type of modules must be installed.
	Power supply modules	Power supply bays		Up to 4 units
		Redundant configuration	Rated at 100 Vac	1+1 or 2+1 or 2+2 or 3+1
			Rated at 200 Vac	1+1 or 2+1 or 2+2 or 3+1
		Power input		100 Vac: 3597 W / 200 Vac: 5140 W
	Fan modules			6 modules as standard (N +M modules configuration)
External dimensions (W x D x H: mm)/number of units according to the EIA standard				447 x 791 x 262 / 6 U
Mass				Maximum: 130 kg (with all modules installed; including rack rails)
Power source	Input voltage (Frequency)			Single Phase AC 100-120 V / 200-240 V (50-60 Hz)
	Power consumption (Maximum)[1]			4678 W
Environmental requirements	Temperature			5 to 40°C [Non-operating: -10 to 43 °C][3]

Items		Specifications
	Humidity	20 to 80 % [Non-operating: 10 to 90 %]
EMC regulations		FCC, ICES, EN55022, EN55024, EN61000, KC KN24, KC KN22, C-Tick, GOST, BSMI, CCC
Noise		60db (A) or lower[2]

Notes:

1. This value is the rating of the server chassis. Actual power consumption depends on the configuration of the server blades.
2. This equipment controls fan rotation according to the temperature of the inlet air. Under the following conditions, the noise level may exceed this value.
   - Inlet air temperature exceeds 25°C.
   - CPU is under heavy load.
   - Fan fails.
   - CB 520H B2 server blade has E5-2637v2 installed.
3. 5 to 30°C [Non-operating: -10 to 43°C] for CB 520H B2 with CPU E5-2637v2 installed.

   5 to 35°C [Non-operating: -10 to 43°C] for CB 520H B3 with CPUE5-2699v3, E5-2697v3, E5-2667v3 and E5-2637v3 installed.

Server Blade Specifications

The following table provides specifications for server blades.

Table 2-2 Xeon Server Blade CPU specification (CB 540A A1/B1)

Items	Specifications		
Supported CPU	E5-4650	E5-4610	E5-4603
Number of Cores	8 C	6 C	4 C
CPU frequency	2.7 GHz	2.4 GHz	2.0 GHz
QPI frequency	8.0 GT/s	7.2 GT/s	6.4 GT/s
L3 cache	20 M	15 M	10 M
TDP	130 W	95 W	95 W
Number of CPUs	Maximum: 4		

Table 2-3 Xeon Server Blade other specification (CB 540A A1/B1)

Items		Specifications
Main memory	DIMM type (per slot)	DDR3 RDIMM, 2 / 4 / 8 / 16 / 32 GB; LR-DIMM 32 GB

Items			Specifications
	Operating mode		Independent channel mode, Rank sparing mode, Mirrored channel mode
	Number of slots		48
	Memory capacity		Maximum: 1024 GB (RDIMM 32 GB x 32); 1536 GB (LR-DIMM 32 GB x 48)
	Memory frequency		800 / 1066 / 1333 / 1600 MT/s
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 1.8 TB
I/O	Internal disk I/F	Controller	LSI SAS 2004 / LSI SAS 2008
		I/F	SAS
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0.1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Onboard LAN[2]	Midplane I/F	10 Gb/1 Gb Ethernet 2 port
		Function	Wake on LAN, PXE boot, iSCSI
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB2.0)
	KVM connector		1 (VGA / COM / USB2.0 / 2port)
DCMI (Data Center Management Interface)			Not supported
Power consumption			1103 W
External dimension (W x D x H: mm)			435.3 x 492.7 x 51.1
Mass			Maximum: 13.3 kg

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. A1 model does not come with the onboard LAN.

Table 2-4 Xeon Server Blade CPU specification (CB 520H A1/B1) - 1

Items	Specifications		
Supported CPU	E5-2680	E5-2670	E5-2640
Number of Cores	8 C	8 C	6 C

Items	Specifications		
CPU frequency	2.7 GHz	2.6 GHz	2.5 GHz
QPI frequency	8.0 GT/s	8.0 GT/s	7.2 GT/s
L3 cache	20 M	20 M	15 M
TDP	130 W	115 W	95 W
Number of CPUs	Maximum: 2		

Table 2-5 Xeon Server Blade CPU specification (CB 520H A1/B1) - 2

Items	Specifications		
Supported CPU	E5-2620	E5-2603	E5-2630L
Number of Cores	6 C	4 C	6 C
CPU frequency	2 GHz	1.8 GHz	2 GHz
QPI frequency	7.2 GT/s	6.4 GT/s	7.2 GT/s
L3 cache	15 M	10 M	15 M
TDP	95 W	80 W	60 W
Number of CPUs	Maximum: 2		

Table 2-6 Xeon Server Blade other specification (CB 520H A1/B1)

Items			Specifications
Main memory	DIMM type (per slot)		DDR3 RDIMM, 2 / 4 / 8 / 16 / 32 GB; LR DIMM 32 GB
	Operating mode		Independent channel mode, Rank sparing mode, Mirrored channel mode
	Number of slots		24
	Memory capacity		Maximum: 512 GB (32 GB x 16); 768 GB (LR-DIMM 32 GB x 24)
	Memory frequency		800 / 1066 / 1333 / 1600 MT/s
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 1.8 TB
I/O	Internal disk I/F	Controller	LSI SAS 2004 / LSI SAS 2008
		I/F	SAS
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0.1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32

Items			Specifications
	Internal USB port		USB2.0 x 2port (For LPAR manager)
	Onboard LAN[2]	Midplane I/F	10 Gb/1 Gb Ethernet 2 port
		Function	Wake on LAN, PXE boot, iSCSI
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB2.0)
	KVM connector		1 (VGA / COM / USB2.0 / 2port)
DCMI (Data Center Management Interface)			Not supported
Power consumption			529 W
External dimension (W x D x H: mm)			215.4 x 492.7 x 51.1
Mass			Maximum: 7.1 kg

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. A1 model does not come with the onboard LAN.

Table 2-7 Xeon Server Blade CPU specification (CB 520H B2) - 1

Items	Specifications			
Supported CPU	E5-2643 v2	E5-2697 v2	E5-2690 v2	E5-2650 v2
Number of Cores	6 C	12 C	10 C	8 C
CPU frequency	3.5 GHz	2.7 GHz	3.0 GHz	2.6 GHz
QPI frequency	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s
L3 cache	25 M	30 M	25 M	20 M
TDP	130 W	130 W	130 W	95 W
Number of CPUs	Maximum: 2			

Table 2-8 Xeon Server Blade CPU specification (CB 520H B2) - 2

Items	Specifications			
Supported CPU	E5-2630 v2	E5-2603 v2	E5-2637 v2[1]	E5-2670 v2
Number of Cores	6 C	4 C	4 C	10 C
CPU frequency	2.6 GHz	1.8 GHz	3.5 GHz	2.5 GHz
QPI frequency	7.2 GT/s	6.4 GT/s	8.0 GT/s	8.0 GT/s
L3 cache	15 M	10 M	15 M	25 M
TDP	80 W	80 W	130 W	115 W

Items	Specifications
Number of CPUs	Maximum: 2
Notes: 1. Inlet air temperature is restricted to 5 to 30°C [Non-operating: -10 to 43°C].	

Table 2-9 Xeon Server Blade other specification (CB 520H B2)

Items			Specifications
Main memory	DIMM type (per slot)		DDR3 RDIMM, 4 / 8 / 16 GB LR-DIMM 32 GB
	Operating mode		Independent channel mode, Rank sparing mode, Mirrored channel mode
	Number of slots		24
	Memory capacity		Maximum: 384 GB (RDIMM 16 GB x 24); 768 GB (LR-DIMM 32 GB x 24)
	Memory frequency		800 / 1066 / 1333 / 1600 / 1866 MT/s
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 2.4 TB
I/O	Internal disk I/F	Controller	LSI SAS 2008
		I/F	SAS
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0, RAID 1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Onboard LAN	Midplane I/F	10 GB/1 GB Ethernet 2 port
		Function	Wake on LAN, PXE boot, iSCSI
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB2.0)
	KVM connector		1 (VGA / COM / USB2.0 / 2 port)
DCMI (Data Center Management Interface)			Not supported
Power consumption			613 W
External dimension (W x D x H: mm)			215.4 x 492.7 x 51.1
Mass			Maximum: 7.1 kg

Items	Specifications
Notes: 1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.	

Table 2-10 Xeon Server Blade CPU specification (CB 520H B3) - 1

Items	Specifications					
Supported CPUs	E5-2699 v3[1]	E5-2698 v3	E5-2697 v3[1]	E5-2690 v3	E5-2660 v3	E5-2640 v3
Number of cores	18 C	16 C	14 C	12 C	10 C	8 C
CPU frequency	2.3 GHz	2.3 GHz	2.6 GHz	2.6 GHz	2.6 GHz	2.6 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	9.6 GT/s	8.0 GT/s
L3 Cache	45 MB	40 MB	35 MB	30 MB	25 MB	20 MB
TDP	145 W	135 W	145 W	135 W	105 W	90 W
Number of CPUs	Maximum: 2					
Notes: 1. Inlet air temperature is restricted to 5 to 35°C [Non-operating: -10 to 43°C].						

Table 2-11 Xeon Server Blade CPU specification (CB 520H B3) - 2

Items	Specifications			
Supported CPUs	E5-2620 v3	E5-2603 v3	E5-2667 v3[1]	E5-2637 v3[1]
Number of cores	6 C	6 C	8 C	4 C
CPU frequency	2.4 GHz	1.6 GHz	3.2 GHz	3.5 GHz
QPI frequency	8.0 GT/s	6.4 GT/s	9.6 GT/s	9.6 GT/s
L3 Cache	15 MB	15 MB	20 MB	15 MB
TDP	85 W	85 W	135 W	135 W
Number of CPUs	Maximum: 2			
Notes: 1. Inlet air temperature is restricted to 5 to 35°C [Non-operating: -10 to 43°C].				

Table 2-12 Xeon Server Blade other specification (CB 520H B3)

Items		Specifications
Main Memory	DIMM type (per slot)	DDR4 RDIMM 8, 16 GB LRDIMM 32 GB
	Operating mode	Independent Channel Mode, Rank Sparing Mode, Mirrored Channel Mode
	Number of slots	24

Items			Specifications
	Maximum capacity		RDIMM: 384 GB (16 GB x 24) LRDIMM: 768 GB(32 GB x 24)
	Memory frequency		2133, 1866, 1600 MT/s
HDD / SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 2.4 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS (SATA is not supported)
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0, 1
	VGA	Resolution	640 x 400 - 1680 x 1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal SD card on Daughter card		1 (SD card slots per Daughter card: 2)
	Onboard LAN (Only if mezzanine card 1 is not installed)	Midplane I/F	4-port 10 Gb Ethernet
		Functions	Wake on LAN, PXE boot, iSCSI, FCoE
Management functionality	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC +12V
Front interface	USB		1 (USB 3.0)
	KVM connector		1 (VGA, COM, 2-port USB 2.0)
DCMI (Data Center Management Interface)			Supported
Power consumption			517 W
External dimensions (W x D x H: mm)			215.4 x 500.6 x 51.1
Mass			7.1 kg
Notes: 1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.			

Table 2-13 Xeon Server Blade CPU specification (CB 520A A1)

Items	Specifications				
Supported CPU	E5-2470	E5-2440	E5-2420	E5-2403	E5-2430L
Number of Cores	8 C	6 C	6 C	4 C	6 C
CPU frequency	2.3 GHz	2.4 GHz	1.9 GHz	1.8 GHz	2 GHz
QPI frequency	8.0 GT/s	7.2 GT/s	7.2 GT/s	6.4 GT/s	7.2 GT/s

Items	Specifications				
L3 cache	20 M	15 M	15 M	10 M	15 M
TDP	95 W	95 W	95 W	80 W	60 W
Number of CPUs	Maximum: 2				

Table 2-14 Xeon Server Blade other specification (CB 520A A1)

Items			Specifications
Main memory	DIMM type (per slot)		DDR3 RDIMM, 2 / 4 / 8 / 16 / 32 GB
	Operating mode		Independent channel mode, Rank sparing mode, Mirrored channel mode
	Number of slots		12
	Memory capacity		Maximum: 384 GB (32 GB x 12)
	Memory frequency		800 / 1066 / 1333 / 1600 MT/s
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 2 TB
I/O	Internal disk I/F	Controller	LSI SAS 2004 / LSI SAS 2008 or Patsburg
		I/F	SAS/SATA
		Number of I/F	Maximum: 2 (2.5 inch SAS HDD, SATA HDD, SSD)
		RAID function	RAID 0.1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB2.0 x 2port (For LPAR manager)
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB2.0)
	KVM connector		1 (VGA / COM / USB2.0 / 2port)
DCMI (Data Center Management Interface)			Not supported
Power consumption			396 W
External dimension (W x D x H: mm)			215.4 x 492.7 x 51.1
Mass			Maximum: 6.2 kg

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.

Table 2-15 Xeon Server Blade CPU specification (CB 520X B1) - 1

Items	Specifications			
Supported CPU	E7-4820v2	E7-4860v2	E7-4880v2	E7-8880v2
Number of Cores	8 C	12 C	15 C	15 C
CPU frequency	2.0 GHz	2.6 GHz	2.5 GHz	2.5 GHz
QPI frequency	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s
L3 cache	12 M	30 M	37.5 M	37.5 M
TDP	105 W	130 W	130 W	130 W
Number of CPUs	Maximum: 2			

Table 2-16 Xeon Server Blade CPU specification (CB 520X B1) - 2

Items	Specifications	
Supported CPU	E7-8890v2	E7-8891v2
Number of Cores	15 C	10 C
CPU frequency	2.8 GHz	3.2 GHz
QPI frequency	8.0 GT/s	8.0 GT/s
L3 cache	37.5 M	37.5 M
TDP	155 W	155 W
Number of CPUs	Maximum: 2	

Table 2-17 Xeon Server Blade other specification (CB 520X B1)

Items			Specifications
Main memory	DIMM type (per slot)		DDR3 RDIMM, 8 / 16 GB; LR DIMM 32 GB
	Operating mode		Independent Mode (Default), Lockstep Mode, Rank Sparing Mode, Mirrored Memory Mode
	Number of slots		48
	Memory capacity		Maximum: 1536 GB (32 GB x 48)
	Memory frequency		1066 / 1333 / 1600 MT/s
Inter-blade SMP (Symmetric Multi Processing)			2-blade SMP / 4-blade SMP
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 2.4 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of I/F	Maximum: 2
		RAID function	RAID 0.1

Items			Specifications
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB2.0 x 2port (For LPAR manager)
	Onboard LAN	Midplane I/F	10 Gb Ethernet 4 port
		Function	Wake on LAN, PXE boot, iSCSI, FCoE
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)[2]
	KVM connector		1 (VGA / COM / USB2.0 / 2port)[2]
DCMI (Data Center Management Interface)			Not supported
Power consumption			738 W
External dimension (W x D x H: mm)			435.3 x 492.7 x 55.5 (2S)
Mass			Maximum: 13.8 kg[3]

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. In SMP configuration between blades, VGA and COM are not available and only USB port is available on non-primary server blades.
3. The Mass of a server blade includes that of SMP connection board.

Table 2-18 Xeon Server Blade CPU specification (CB 520X B2)

Items	Specifications		
Supported CPU	E7-8880v3	E7-8890v3	E7-8893v3
Number of Cores	18 C	18 C	4 C
CPU frequency	2.3 GHz	2.5 GHz	3.2 GHz
QPI frequency	9.6 GT/s	9.6 GT/s	9.6 GT/s
L3 cache	45 M	45 M	45 M
TDP	150 W	165 W	140 W
Number of CPUs	Maximum: 2		

Table 2-19 Xeon Server Blade other specification (CB 520X B2)

Items		Specifications
Main memory	DIMM type (per slot)	DDR4 RDIMM: 8 GB, 16 GB, 32 GB

Items			Specifications
	Operating mode		Independent Mode (Default), Lockstep Mode, Rank Sparing Mode, Mirrored Memory Mode
	Number of slots		48
	Memory capacity		Maximum: 1,536 GB (32 GB x 48)
	Memory frequency		1333 / 1600 / 1866 MT/s
Inter-blade SMP (Symmetric Multi Processing)			2-blade SMP / 4-blade SMP
HDD/SSD	Number of HDDs		Maximum: 2
	Capacity[1]		Maximum: 2.4 TB
I/O	Internal disk I/F	Controller	LSI SAS 3004
		I/F	SAS
		Number of I/F	Maximum: 2
		RAID function	RAID 0.1
	VGA	Resolution	640x400 - 1680x1050
		Refresh rate	60 - 85 Hz
		Bit per pixel	8, 16, 32
	Internal USB port		USB2.0 x 2port (For LPAR manager)
	Onboard LAN	Midplane I/F	10 Gb Ethernet 4 port
		Function	Wake on LAN, PXE boot, iSCSI, FCoE
Management function	Remote console		Supported
	COM		Serial redirection
DC input supply voltage			DC + 12 V
Front interface	USB		1 (USB 3.0)[2]
	KVM connector		1 (VGA / COM / USB2.0 / 2port)[2]
DCMI (Data Center Management Interface)			Supported
Power consumption			722 W
External dimension (W x D x H: mm)			435.3 x 492.7 x 55.5 (2S)
Mass			Maximum: 13.8 kg[3]

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. In SMP configuration between blades, VGA and COM are not available and only USB port is available on non-primary server blades.
3. The Mass of a server blade includes that of SMP connection board.

Table 2-20 Server Blade specification (Storage Expansion model)

Items			Specifications
HDD/SSD	Number of HDDs		Maximum: 6
	Capacity[1]		Maximum: 5.4 TB
I/O	Internal disk I/F	Controller	LSI SAS 2208
		I/F	SAS
		Number of I/F	Maximum: 6 (2.5 inch SAS HDD, SSD)
		RAID function	RAID 0.1, 5, 10.6
DC input supply voltage			DC + 12 V
Front interface	SAS		1 port (4 lanes)
Power consumption			93 W[2]
External dimension (W x D x H: mm)			435.3 x 492.7 x 55.5
Mass			Maximum: 8.1 kg[3]

Notes:

1. Hard disk drive capacity is calculated assuming that 1 GB is equal to 10^9 bytes.
2. This is a value of single storage expansion blade.
3. This is a value of storage expansion blade including the shelf parts.

Table 2-21 Server Blade specification (PCI Expansion model)

Items			Specifications
I/O	PCI slot	Interface	PCI Express
		Number of slots	Maximum: 6 slots - Full height, Full length slots: 2 (PCI expansion slot 0/1) - Low profile (MD2) slots: 4 (PCI expansion slot 2/3/4/5)
	Slot specifications	PCI expansion slot 0	Electrical x8/Physical x8; Maximum: 25 W
		PCI expansion slot 1	Electrical x8/Physical x8; Maximum: 25 W
		PCI expansion slot 2/slot 3	- Electrical x8/Physical x8; Maximum: 25 W (PCI blade card adapter x8 L/P) - Electrical x4/Physical x8; Maximum: 25 W (PCI blade card adapter x4 L/P)
		PCI expansion slot 4/slot 5	Electrical x4/Physical x8; Maximum: 25 W
DC input supply voltage			DC + 12 V
Power consumption			294 W[1]
External dimensions (W x D x H: mm)			215.4 x 492.7 x 51.1[1]

Items	Specifications
Mass	Maximum: 9.11 kg[2]
Notes: 1. This value is for a single PCI expansion blade. 2. This value includes the shelf for a PCI expansion blade.	

Management Module Specifications

The following table provides the management module specifications.

Table 2-22 Management Module specifications

Items		Specifications
External ports	Management LAN	1000BASE-T/100BASE-TX/10BASE-T x 1 port
		1000BASE-T/100BASE-TX/10BASE-T x 1 port
		1000BASE-T/100BASE-TX/10BASE-T x 1 port
	Serial	1 port
Indicators (LED)		6 LEDs (Power / Primary / Alarm / Remote / Identify / Heartbeat)
Console functions	CLI console	A CLI (Command Line Interface) provided to the user for system operation and management.
	Web console (GUI)	A web console GUI provided to the user for system operation and management.
Remote maintenance functions	E-mail notification	E-mail notification of error information (Alert).
	Remote maintenance	Remote maintenance functionality linked to the ASSIST remote maintenance system.
	Firmware update	Available
External dimensions (W x D x H: mm)		146 x 252 x 25
Mass		0.6 kg

Switch Module Specifications

The following table provides specifications for switch modules.

Table 2-23 LAN Switch Module specifications

Items			Specifications		
			1 Gb/sec LAN switch module (40 ports)	1 Gb/sec LAN switch module (20 ports)	1/10-Gb/sec LAN switch module
Ports	External		10/100/1000BASE-T x 8	10/100/1000BASE-T x 4	
			-		10GBASE-R x 2
	Internal		1000BASE-Serdes x 32 (Server blade I/F)	1000BASE-Serdes x 16 (Server blade I/F)	
Connector	10/100/1000BASE-T x 4		RJ-45		
	10 G		-		XFP
Console / management ports			10/100 Ethernet (RJ-45) Serial port (RS-232C) In-band through the management module		
Layer-2 functions	VLAN		Port VLAN, Tag-VLAN (IEEE802.1Q), Protocol VLAN, MAC-VLAN, Tag conversion		
	Spanning tree protocol		STP (IEEE802.1D), RST P(IEEE802.1w), PVST+, MSTP(IEEE802.1s)		
	Other functions		IGMP, snooping, MLD snooping, Link aggregation, jumbo frame, IEEE802.3ah / UDLD, Ring protocol		
Layer-3 functions	IPv4 routing	Uni-cast	Static, RIP, RIP2, OSPF, BGP4		
		Multi-cast	IGMPv2/v3, PIM-SM, PIM-SSM		
	IPv6 routing	Uni-cast	Static, RIPing, OSPFv3, BGP4+		
		Multi-cast	MLDv1/v2, PIM-SM, PIM-SSM		
Network functions	Security functions		Filter (L2 / IPv4 / IPv6 / L4), port to port relay interruption, IEEE802.1X authentication		
	QoS		Flow detection (L2 / IPv4 / IPv6 / L4), band monitoring (rate control), marking (DSCP / User Priority), Priority control (Flow base, User priority mapping), disposal control (taildrop), shaper (eight classes, port band control), scheduling (PQ, WRR, PQ+DRR, WFQ), Diff-serv, IEEE802.1p		
	High reliability, Advanced operation		Load balancing (IPv4 / IPv6), VRRP (IPv4 / IPv6), Static polling, VRRP polling, Link aggregation (IEEE802.3ad), GSRP, Graceful Restart (Helper), Storm control		
	L2-VPN		VLAN tunneling		
Operation management functions			SNMPv1 / v2 / v3, MIB II, IPv6MIB, RMON, syslog, ping, traceroute, SSH, telnet, ftp, tftp, NTP, IPv4DHCP server/relay, PrefixDelegation, LLDP, OADP, port mirroring, RADIUS, TACACS+, Uplink failover, (Dynamic) Flow statistics/information (sFlow)		

Items	Specifications		
	1 Gb/sec LAN switch module (40 ports)	1 Gb/sec LAN switch module (20 ports)	1/10-Gb/sec LAN switch module
Power supply	12 V		
External dimensions (W x D x H: mm)	161 x 243 x 32.3 (excluding backplane connector)		
Mass	1.2 kg		1.40 kg

Table 2-24 1 Gb/sec LAN Pass-through Module specifications

Items		Specifications
Ports	Internal	1-Gb/sec Serdes x 16
	External	Fixed at 1000BASE-T x 16
	Outside	Fixed at Full Duplex
Connector		RJ-45
Power supply		12 V
External dimensions (W x D x H: mm)		161 x 252 x 32.3
Mass		1.5 kg

Table 2-25 10 Gb/sec LAN Pass-through Module specifications

Items		Specifications
Ports	Internal	10 Gb KR x 16 ports (server blade interface)
	External	SFP+ optical transceiver (10 Gb) x 16 ports
Connector		SFP+ (10 Gb)
Power supply		12 V
External dimensions (W x D x H: mm)		161 x 252 x 32.3
Mass		1.7 kg (SFP+ optical transceiver x 16 ports)

Table 2-26 Brocade 10 Gb/sec DCB Switch Module specifications

Items	Specifications
Link speed	10 Gbps, 1 Gbps
Ethernet	Flow control (802.3x), Jumbo frame
Layer 2	Function port VLAN, Tag-VLAN (IEEE 802.1Q), Protocol VLAN, MAC-VLANSTP (IEEE 802.1D), RSTP (IEEE 802.1w), PVST+, MSTP (IEEE 802.1s) link aggregation (static, IEEE 802.3ad), uplink-failover

Items	Specifications
	IGMP V2/V3 snooping, Storm Control
Security	ACLs (standard, VLAN-based, Port-based), IEEE 802.1X, Radius, TACACS+
QoS	8 Class Queue, CoS, Priority Queue, DWRR
Management	telnet, ftp, IPv4 SNMP (v1/v2), Ping, tracert, Cisco like CLI
CEE (Converged Enhanced Ethernet)	Priority-based Flow Control(PFC) – IEEE 802.1Qbb Enhanced Transmission Selection (ETS) – IEEE 802.1Qaz Data Center Bridging eXchange (DCBX) – IEEE DCB
High availability	Function associated with LAN controller redundancy (failover association), hot-plug replacement, configuration backup

Table 2-27 Brocade 8 Gb/sec Fibre Channel Switch Module specifications

Items		Specifications
FCSW component		Brocade 5460
Fibre channel ports		Minimum: 12 ports, internal and/or external, assigned as desired. Maximum: 16 internal ports (Serdes interfaces to the server blades) 6 external ports
Supported line speeds		2.125 Gb/sec line speed, full duplex, 4.25 Gb/sec line speed, full duplex, 8.5 Gb/sec line speed, full duplex
Total bandwidth		374 Gb/sec 22 ports x 8.5 Gb/sec (line speed) x 2 (full duplex)
Fabric latency		700 ns (8 Gb/sec with cut-through routing)
Fibre channel specification	Supported standards	Fibre channel specification
	Service classes	Class 2, class 3, class F
Maximum frame size		2112 byte payload
Data traffic		Unicast, multicast, broadcast
Media type		8 Gb SFP+, LC connector, short-wave laser Maximum distance: 500 m at 1 Gb/sec; 300 m at 2 Gb/sec; 150 m at 4 Gb/sec; 50 m at 8 Gb/sec
Scalability		Full fabric architecture with up to 239 switches
Console / management ports		10/100 Ethernet (RJ-45) Serial port (RS-232C)

Items		Specifications
		In-band through the management module
Fabric service	Standard	Fabric service
	Optional (at additional charge)	Ports On Demand (POD) Fabric Watch ISL Trunking
Hardware options		SFP+ (for adding one external port)
		USB memory (for updating firmware; backing up and restoring configuration) These functions are also available through FTP server without this option.
Operation management		SNMPv1, syslog, telnet, http, ftp
Power supply		12 V
External dimensions (W x D x H: mm)		161 x 252 x 32.3
Mass		1.5 kg (including SFP+)

Table 2-28 Brocade 16 Gb/sec Fibre Channel Switch Module specifications

Items		Specifications
FCSW component		Brocade 6546
Fibre channel ports		Minimum: 12 ports, internal and/or external, assigned as desired. Maximum: 16 internal ports (Serdes interfaces to the server blades) 8 external ports
Supported line speeds		4.25 Gb/sec line speed, full duplex, 8.5 Gb/sec line speed, full duplex, 14.025 Gb/sec line speed, full duplex
Total bandwidth		673 Gb/sec 24 ports x 14.025 Gb/sec (line speed) x 2 (full duplex)
Fabric latency		700 ns (16 Gb/sec with cut-through routing)
Fibre channel specification	Supported standards	Fibre channel specification
	Service classes	Class 2, class 3, class F
Maximum frame size		2112 byte payload
Data traffic		Unicast, multicast, broadcast
Media type		16 Gb SFP+, LC connector, short-wave laser Maximum distance: • Multi-mode 62.5 µm cable (OM1) 70 m at 4 Gb/sec; 21 m at 8 Gb/sec; 15 m at 16 Gb/sec

Items		Specifications
		• Multi-mode 50 µm cable (OM2) 150 m at 4 Gb/sec; 50 m at 8 Gb/sec; 35 m at 16 Gb/sec • Multi-mode 50 µm cable (OM3) 380 m at 4 Gb/sec; 150 m at 8 Gb/sec; 100 m at 16 Gb/sec • Multi-mode 50 µm cable (OM4) 400 m at 4 Gb/sec; 190 m at 8 Gb/sec; 125 m at 16 Gb/sec
Scalability		Full fabric architecture with up to 239 switches
Console / management ports		10/100 Ethernet Serial port (RS-232C) In-band through the management module
Fabric service	Standard	Fabric service
	Optional (at additional charge)	Ports On Demand (POD) Fabric Vision ISL Trunking
Hardware options		SFP+ (for adding one external port)
Operation management		SNMPv1, SNMPv3, syslog, telnet, http, ftp
Power supply		12 V
External dimensions (W x D x H: mm)		161 x 252 x 32.3
Mass		1.5 kg (including SFP+)

Power Supply Module Specifications

The following table provides the power supply module specifications.

Table 2-29 Power Supply Module specifications

Items		Specifications
Input	Nominal supply voltage	100-127 Vac 200-240 Vac
	Permissible supply voltage variation	89-132/178-264 Vac (Continuous) 80-138/160-276 Vac (500 ms)
	Frequency	50/60 Hz (±3 Hz)
	Current	12 A (Nominal), 13.5 A (500 ms maximum)
	Efficiency	84 % at 10 % load 90 % at 20 % load 94 % at 50 % load 91 % at 100 % load

Items				Specifications	
	Power factor			0.95 or greater at 100% load	
	Inrush current			50 A (100 µs-10 ms after application of AC power) 15 A (10 ms-150 ms after application of AC power)	
	Leakage current			0.58 mA (264 Vac, 60 Hz)	
Output	Channels			Main (12 V)	Sub (5 V)
	Nominal voltage			+12 V	+5 V
	Current			175 A	5 A
	Power			2142 W (200 Vac)	25 W (200 Vac)
	Protection	Over-current	OCP1	200 Vac: 227.5 A (+30 %, 100 ms)	-
			OCP2	200Vac: 203A (+16%, 500 ms)	-
			OCP	-	5.5 A(10 %, 200 ms)
		Over-voltage		13.0 V	5.5 V

Fan Module Specifications

The following table provides the fan module specifications.

Table 2-30 Fan Module specifications

Items	Specifications
Voltage rating	12 V (10.8 to 13.2 V)
Current rating	7.88 A (100 % Duty)
Input power rating	94.6 W (100 % Duty)
Number of fans	2
Maximum air flow	3.45 m^3/min (121.8 CFM)
Maximum static pressure	970.0 Pa (3.90 inches H_2O)
Operating temperature	5 to 40°C[1]
Hot Swap	Available
Redundancy	N+1
Mass	1.18 kg
External dimensions (W x D x H: mm)	88 x 83 x 267

Notes:

1. 5 to 30°C [Non-operating: -10 to 43°C] for CB 520H B2 with CPU E5-2637v2 installed. 5 to 35°C [Non-operating: -10 to 43°C] for CB 520H B3 with CPU E5-2699v3, E5-2697v3, E5-2667v3, and E5-2637v3 installed.

Transceiver and Cable Specifications

The following table provides specifications for transceivers and cables.

Table 2-31 10GBASE-R transceiver specifications

Items	Specifications					
Transceiver	XFP-SR					XFP-LR
Interface	10GBASE-SR					10GBASE-LR
Connector	2 league LC connectors					
Dimensions (W x D x H: mm)	18.35 x 78.0 x 8.5					
Hot plug	Not supported					
Cable type	Multimode fiber-optic cable					Single mode fiber-optic cable
	50 / 125 µm			62.5 / 125 µm		50 / 125 µm
Transmission band	400 MHz/km	500 MHz/km	2000 MHz/km	160 MHz/km	200 MHz/km	-
Transmission distance	2 m to 66 m	2 m to 82 m	2 m to 300 m	2 m to 26 m	2 m to 33 m	2 m to 10 Km

Table 2-32 10GBASE-SR transceiver specifications

Items	Specifications					
Form factor	SFP+					SFP
Interface	10GBASE-SR					1000BASE-T
Connector	2 ganged LC connectors					RJ-45
Dimensions (W x D x H: mm)	14.8 x 12.4 x 56.7					13.67 x 13.97 x 66.04
Cable type	Multimode fiber-optic cable					Cat 5e twisted cable
	50 / 125 µm			62.5 / 125 µm		-
Transmission band	400 MHz/km	500 MHz/km	2000 MHz /km	160 MHz/km	200 MHz/km	-
Transmission distance	2 m to 66 m	2 m to 82 m	2 m to 300 m	2 m to 26 m	2 m to 33 m	100 m

Table 2-33 10 G direct attach cable specifications

Items	Specifications
Form factor	SFP+ (integrated with the cable)
Power consumption	0.25 to 0.27 W

Items	Specifications		
Cable type	Twinax		
Cable length	1 m	3 m	5 m
Regulatory compliance	Complies with IEEE802.3ae		

Interface Port Pin-outs

This section describes interface port pin-outs.

USB Connector

The following figure shows USB connector installed in the front panel and server blades.

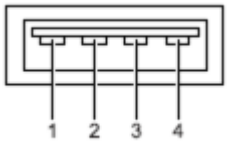

Figure 2-1 USB Connector

Table 2-34 USB connector pin-out

Pin	Signal Name	Description	Direction
1	VBUS	+5V supply voltage	Output
2	D -	Data- signal line	Input / Output
3	D +	Data+ signal line	Input / Output
4	GND	Supply Ground	-

RS-232C Interface Connector (Management Module)

The following figure shows RS-232C interface connector installed in management modules.

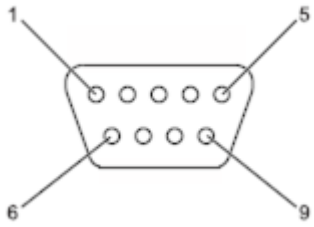

Figure 2-2 RS-232C Interface Connector

Table 2-35 RS-232C connector pin-out

Pin	Signal Name	Description	Direction
1	DCD	Data Carrier Detect. DCE is connected to the telephone line.	Input
2	RD	Received Data. Carries data from DCE to DTE.	Input
3	TD	Transmitted Data. Carries data from DTE to DCE.	Output
4	DTR	Data Terminal Ready. Indicates presence of DTE to DCE.	Output
5	GND	Common Ground	-
6	DSR	Data Set Ready. DCE is ready to receive commands or data.	Input
7	RTS	Request To Send. DTE requests the DCE prepare to receive data.	Output
8	CTS	Clear To Send. Indicates DCE is ready to accept data.	Input
9	RI	Ring Indicator. DEC has detected an incoming ring signal on the telephone line.	Input

LAN Connector

The following figure shows LAN connector installed in management modules and switch modules.

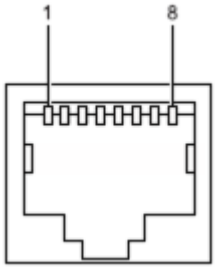

Figure 2-3 LAN Connector

Table 2-36 LAN connector pin-out for 100BASE-TX/10BASE-T

Pin	Signal Name	Description	Direction
1	BI_DA+	Bi-directional pair A+	Input / Output
2	BI_DA-	Bi-directional pair A-	Input / Output
3	BI_DB+	Bi-directional pair B+	Input / Output
4	BI_DC+	Bi-directional pair C+	Input / Output
5	BI_DC-	Bi-directional pair C-	Input / Output
6	BI_DB-	Bi-directional pair B-	Input / Output
7	BI_DD+	Bi-directional pair D+	Input / Output
8	BI_DD-	Bi-directional pair D-	Input / Output

Table 2-37 Specifications of LAN Interface Connector for 100BASE-TX/10BASE-T connection

Pin	Signal Name	Description	Direction
1	TX+	Transmit Data +	Output
2	TX-	Transmit Data -	Output
3	RX+	Received Data +	Input
4	N/C	Not connected	-
5	N/C	Not connected	-
6	RX-	Received Data -	Input
7	N/C	Not connected	-
8	N/C	Not connected	-

A

Service Life Limited Parts

This Appendix-A describes service life limited parts.

- About service life limited parts for CB 500

About service life limited parts for CB 500

This system unit is designed for life expectancy of five years when operating for 24 hours a day, 30 days a month. Some parts with limited life expectancy in the system unit will be degraded or worn out in operation.

The following table shows a main part with limited life. Replacing the part with limited life is offered at cost. Consult your reseller or maintenance company.

Product name	Applicable product model	Remarks
SATA hard disk unit	UH35005X1, UH3N1T5X1	1

Notes:

1. When the system operates with specifications shown in System Unit Specifications on page 2-2, the estimated service life with power-on is about 26,000 hours. When the system operates for 24 hours a day, 30 days a month, the estimated service life is about three years. When you use the system beyond the specifications mentioned above, an error can occur or the service life can be shortened.

When an error occurs on HDD or SSD, the stable operation of the system is extremely affected. It is recommended that you replace it with a new one before the service life expires.

Tip: Product life expectancy is just an estimated limit. It is not guaranteed that no failure occurs within the period.

B

Expiration of RoHS exemption

This Appendix-B describes expiration of RoHS exemption.

- About expiration of RoHS exemption

About expiration of RoHS exemption

This system unit currently complies with RoHS, containing no hazardous substance restricted. Some components, however, are exempt from RoHS.

Some RoHS exemptions will be expired in December 2012. Those RoHS-exempt components will not comply with RoHS for shipment on or after January 2013.

Product concerned	RoHS-exempt product code not to comply with RoHS	Successor product code to comply with RoHS
CB500 server chassis	GGX-SRE3A1TBX1	GG-RE3A1NBXR-Y
1 Gb LAN switch module	GGX-BE3LSW1X1	GV-BE2LSW1XR-Y
1/10 Gb LAN switch module	GGX-BE3LSW2X1	GV-BE2LSW2XR-Y
1 Gbps LAN pass through module	GGX-BE3LPS1X1	GV-BE2LPS1XR-Y
10GBASE-SR XFP module	GGX-CN3XFP1X1	GV-CN2XFP1XR-Y

Note: If any of non-RoHS-compliant products, shown in the center column in the table above, is installed in a RoHS-compliant chassis, the whole unit does not comply with RoHS. There is no functional difference between non-RoHS-compliant products and their RoHS-compliant successors.

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